# INDIA RUBBER WORLD

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*Henry C. Pearson, F. R. G. S., Founder*


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# Rubber Age Resisters[1]

## *Chemical Prevention Against Deterioration by Oxygen, Sunlight, Ozone, Heat, and Reversion of Cure in Storage and Service*

WEBSTER NORRIS

¶ ***The useful life of all rubber goods can be greatly extended by means of a variety of organic compounding materials classed as antioxidants which function to prevent deterioration by aging.***

FROM the inception of vulcanized rubber goods production manufacturers have been faced with innumerable technical problems. One of the most pressing of these and the last to be solved was the apparently inevitable tendency of rubber to lose its elastic properties and become valueless owing to internal and external causes.

Oxidation, heat, and direct sunlight were recognized for many years as the chief agencies of rubber deterioration. They were long contended against, with little success, by various means, such as the restriction of sulphur to a minimum to retard progressive overcure and by the inclusion in rubber mixings of various nonoxidizing materials and softeners. Compounding materials commonly used, in part at least, for their protective effect were such bituminous materials as: coal tar in footwear, mineral rubber in molded goods, petrolatum and paraffin wax in tubed work, palm oil and petrolatum in frictions, and factice in stocks for spreading. Each of these materials aided somewhat to prolong the aging of the rubber, but none eliminated the causes of the trouble.

To supplement these compounding efforts, the precaution was urged to prevent heat and sunlight deterioration by storage of the goods in a cool, dark place until required for service. The need of such protection is especially urgent and desirable in the tropics where it is the practice to protect pure gum hospital rubber supplies such as tubing, bulbs, sheet rubber, water bottles, catheters, etc., by storing them sealed under water in the dark until needed. This method, naturally has rather limited application. Until within a few years no better measures were known than those mentioned, and little expectation was generally entertained of finding more effective means of rubber preservation.

More effective means for preserving all kinds of rubber goods became increasingly urgent with the growth of the industry, particularly for those products subjected to heat developed in service as tires and inner tubes, especially the latter for use in bus and heavy truck pneumatic tires. The temperature of tubes in truck service may run to 200° F., which would render the best tube short lived unless protected by a preservative. A similar condition of heat developed in flexing service is that of transmission belting, which results in deterioration of the rubber uniting the duck plies.

Many accelerators display marked preservative effect on the rubber hydrocarbon by protecting it against oxidation. Notable examples of such age resisting accelerators are Vulcanol, Crylene, A-19, R. & H. 50, Monex, Thionex, and Captax.

As in the search for accelerators many antioxidant materials have been studied and given practical tests under controlled conditions in the laboratory and widely varying weather conditions of the temperate and tropical zones. The practical results attained are most remarkable in goods of all grades of quality, beginning with the immensely important items of tires, inner tubes, and rubber footwear, and covering the full range of qualities from heels to elastic thread.

### Antioxidant Types

Certain of the more important antioxidants are classified by Sidney M. Cadwell[2] in the following chemical groups:

1. Aldehyde Condensation Products.
2. Secondary Naphthylamine Derivatives.

[1] Copyright by Webster Norris, March 1, 1930.

[2] "Rubber Antioxidants." Unpublished paper read before the Boston Group, Rubber Division, A. C. S., Dec., 1928.

3. Ethylene Diamine Derivatives.
4. Aromatic Diamines.

The tabulation of commercial antioxidants is arranged by trade names with chemical composition indicated.

### Age-Rite Group

The Age-Rite group of antioxidants comprises three materials. One of these, Age-Rite Resin, is a cherry red resin of 1.16 sp. gr. and brittle when cold. It softens when warmed slightly and flows freely at 212° F. In water it is insoluble, sparingly soluble in gasoline, and freely soluble in benzol and many organic solvents. Its low melting point permits it to disperse uniformly in the rubber. Generally only one per cent of it on the weight of the rubber is needed to produce the desired result. When used in normal proportions, it has very little effect on the curing properties of the stock and does not interfere with the organic accelerator present. The added plasticity and tack that it imparts to rubber helps its working quality and reduces the susceptibility to scorching. Age-Rite Resin is adapted for use in frictions, stocks containing large proportions of reclaim, black soles, and insulated wire, and also aids dispersion of carbon black in rubber.

Age-Rite Powder is a white powder, 1.19 sp. gr., and about 108° C. m.p. It is insoluble in water, slightly soluble in gasoline or alcohol, and freely soluble in benzol. It darkens slightly on storage but does not deteriorate in strength. It fluxes easily with rubber at ordinary milling temperatures; does not soften nor add tackiness to the batch. The material offers marked resistance to tread cracking and the action of oxygen, sunlight, and heat on rubber in high grade and light colored goods.

Age-Rite White is moderately soluble in benzol, ethylene-dichloride, carbon bisulphide, and most organic solvents. It is sparingly soluble in gasoline. At milling temperatures it fluxes smoothly and easily with rubber, without disagreeable odor in the goods. It is effective in acid or vapor cures with sulphur chloride and was the first offered for that purpose. Heretofore no antioxidant has been satisfactory in sulphur chloride cures because any improvement in aging quality has been offset by discoloration both during and after curing and by the presence of a disagreeable odor. Age-Rite White is also effective in ordinary hot cures with sulphur and the usual accelerators. Little if any discoloration is caused by it in either hot or cold cures. On exposure to sunlight this material causes minimum discoloration in most stocks whether hot or cold cured and also to white stocks which ordinarily discolor quite readily.

(*To be continued*)

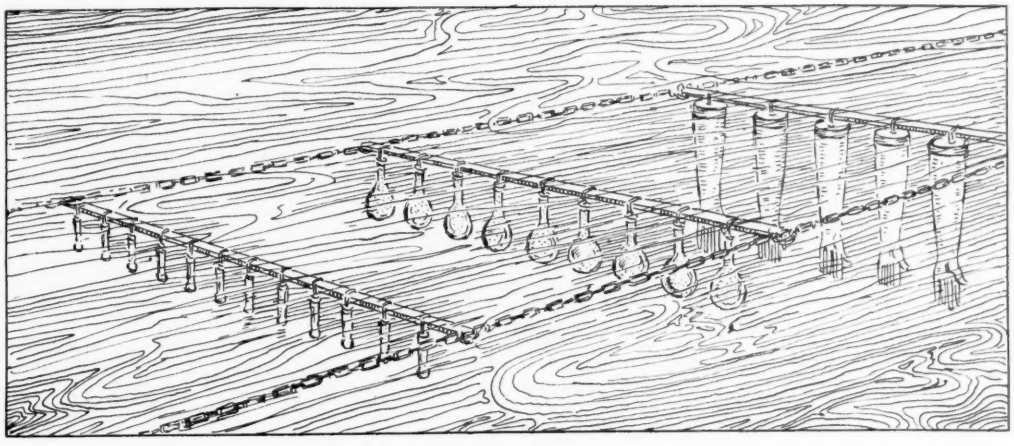
## Antioxidants and Rubber Age Resisters

| No. | Maker | Trade Name | Composition | S. G. | M. P. Deg. C. | Physical State | Color | Effect on Plasticity | Darkening Effect on White or Light Colored Goods in Sunlight | Accelerating Effect | Recommended Applications |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | R.T.V. | Age-Rite Powder | Phenyl-beta-naphthyl-amine. | 1.19 | 108° | Powder. | White. | None. | Distinct. | None.† | Hot cured goods generally. To retard tread cracking. |
| 2 | R.T.V. | Age-Rite Resin | Adol-alpha-naphthyl-amine. | 1.16 | * | Resin. | Red. | Mild softener. | Distinct. | None.† | Hot cured goods generally. Good dispersing agent for carbon black. |
| 3 | R.T.V. | Age-Rite White | Symmetrical di-beta-naphthyl-para-phenyl-diamine. | 1.20 | 170° | Powder. | White. | None. | Distinct. | None.† | Acid or vapor cured goods. Specification goods calling for max. acetone ext. Thread and bands. |
| 4 | N.C.C. | Albasan | Mixture of organic bases and beta-naphthol. | 1.17 | 75°-100° | Either flaked or granulated. | Cream. | None. | Very slight. | Distinct. | Rubberized sheetings, clothing, light and bright colored footwear, druggists' sundries, etc. |
| 5 | du P. | Antox | Butyraldehyde-aniline derivative. | 1.01 | none | Nonvolatile liquid. | Amber. | Mild softener. | Slight. | Distinct.‡ | Truck tubes, steam hose, and all products that may be exposed to high temperatures. Also in footwear because of slight discoloration. |
| 6 | N.C.C. | B-L-E | Amine reaction product. | 1.087 | none | Nonvolatile liquid. | Amber. | Mild softener. | Distinct. | None. | General purpose antioxidant for pure gum and compounded stocks except for pure white and goods of delicate colors. |
| 7 | du P. | Neozone Standard | Phenyl-alpha-naphthylamine with meta-toluylene diamine and stearic acid. | 1.16 | * | Powder. | Tan. | Pronounced stiffener. | Distinct. | Slight.§ | Antioxidant and preventive of reversion, for general use. Prevents fatigue deterioration. |
| 8 | du P. | Neozone A | Phenyl-alpha-naphthylamine. | 1.17 | 50° | Waxy solid. | Cream. | Mild softener. | Distinct. | None. | General use as antioxidant and preventive of tread cracking and other forms of fatigue deterioration. |
| 9 | du P. | Neozone C | Phenyl-alpha-naphthyl-amine and meta-toluylene diamine. | 1.19 | * | Powder. | Tan. | Mild stiffener. | Distinct. | Slight.§ | Improves flexing resistance of frictions and skim coats, especially of those containing reclaims. Also for treads to retard oxidation and cracking, and improve abrasion. |
| 10 | du P. | Neozone D | Phenyl-beta-naphthyl-amine. | 1.18 | 106° | Powder. | White. | None. | Distinct. | None. | Hot cured goods generally to retard tread cracking. |
| 11 | R.S.L. | Oxynone | Unsymmetrical diamino-diphenyl-amine. | 1.29 | 125° | Powder. | Light brown. | Pronounced stiffener. | Distinct. | Distinct.‖ | Tread stocks and hot cured goods in general, except light or bright colored goods. |
| 12 | du P. | Parazone | Not disclosed ..... | 1.20 | 161° | Powder. | White. | None. | None. | None. | All white or light colored products that may be exposed to sunlight, especially white sidewalls. |
| 13 | R.S.L. | Resistox | Aldol aniline ..... | 1.12 | * | Waxy. | Pinkish yellow. | None. | Distinct. | Distinct.¶ | Pure gum and reclaim stocks, but not for tire treads. |
| 14 | C.P.H. | Stabilite | Diphenyl-ethylene-diamine. | 1.15 | 140° | Powder. | Cream. | Strong softener. | Slight. | None. | General use, tire treads, and sidewalls. Prevents fatigue deterioration and absorption of accelerator by carbon black. |
| 15 | C.P.H. | Stabilite Alba | Diortho-tolyl-ethylene-diamine. | 1.12 | 60° | Powder. | Reddish brown. | Slight softener. | Very slight. | None. | Light and bright colored goods. White sidewalls of tires. |
| 16 | N.C.C. | VGB | Acetaldehyde-ethylene-diamine. | 1.15 | 60°-80° | Powdered resin. | Light brown. | Slight softener. | Distinct. | Slight. | Air cured goods, frictions, proofed goods, auto tires, insulated wire, jar rings, mechanical goods. |

*Not definite. †Slight with Captax. ‡Good accelerator in pure gum and noncarbon stocks. §Strong accelerator for Captax. ¶About equal to formaldehyde aniline. ‖Particularly in carbon black and compounded stocks.

C.P.H. = The C. P. Hall Co.; du P. = E. I. du Pont de Nemours & Co., Inc.; N.C.C. = The Naugatuck Chemical Co.; R.S.L. = The Rubber Service Laboratories Co.; R.T.V. = R. T. Vanderbilt Co., Inc.

# A New Water-Cure Process[1]



Water Curing Gloves, Toy Balloons, and Nipples

*New Method of Accelerated Hot Vulcanization in Water Gives High Tensile Properties and Insures Age Resisting Quality*

THE old familiar methods of acid and vapor cure have certain well-known shortcomings, one of which is the liability to perishing of the goods thus cured. Gloves, balloons, and similar thin, pure rubber goods are not very durable even when boxed and stored in a cool dark place. They are naturally less durable in sunlight. The chief trouble seems to be oxidation promoted by the continuing chemical action of the absorbed acid used for curing.

It is well known that the most critical process in the manufacture of all rubber goods is vulcanization. By whatever method this is effected, close control of the process is very desirable. In the case of liquid and vapor curing with sulphur chloride, the quality of the results depends wholly on the skill and judgment of the operator. That this is necessarily so is apparent from the outline here presented of the processes reviewed for comparison with the details of the new water-cure process.

### Cold and Vapor Cure Processes

Cold cure of rubber goods is done at room temperatures in a solution of sulphur chloride in carbon bisulphide. The proportions ordinarily used in preparing this "curing acid" are 4 liquid ounces of sulphur chloride in 5 gallons of carbon bisulphide. The dried, seamless rubber articles on their forms are immersed in this solution. The time necessary to effect a thorough cure varies from 15 to 60 seconds according to the thickness of the rubber.

Gloves are usually cured by exposure to the vapor of sulphur chloride in an enclosed space at 180° F. for an hour, more or less varying with the humidity of the atmosphere. In both acid and vapor curing it is very essential that the goods be thoroughly dry of both naphtha and moisture. In either of these methods the rubber is vulcanized by the absorption of the active sulphur present in the sulphur chloride. Absorption of sulphur chloride in excess results in overcure and rapid deterioration of the goods. When vapor curing is practiced, the precaution is taken to neutralize the sulphur chloride on the surface of the goods by exposing them after vulcanization to an atmosphere of ammonia gas.

### Water Cure for Dipped Goods

Within the past few years a certain new method of vulcanization, adapted to pure gum dipped rubber articles[2], has been developed. As finally perfected, vulcanization is conducted in hot water and produces superior vulcanized articles of high tensile quality and good aging properties. The process is characterized by great simplicity. Vulcanization can be effected in a comparatively short time in water at or below 212° F. Also the rubber mixing is immune to prevulcanization, and free sulphur is practically eliminated from the product.

In operating this process two accelerators, A and B, are employed; either will speed up vulcanization of a stock containing an activating agent such as zinc oxide. Accelerator A acts at a low temperature, and accelerator B at about 250° F. Their combined action will produce vulcanization more quickly at lower temperatures than either will accomplish when used in quantities suitable for the purpose. In actual practice it is found satisfactory to employ zinc oxide as the activator, and ethylidine aniline or hexamethylene tetramine as accelerator B. For accelerator A any suitable water soluble ultra-accelerator is employed, such as tetramethylthiuram monosulphide, or the unoxidized water soluble reaction product of carbon disulphide and dimethylamine.

### Typical Compound

A sample composition consists as follows: rubber 95½ parts, zinc oxide 2 parts, sulphur 2 parts, either "accelerator B" named above, ½ part, and fillers, softeners, and pigments as desired. This composition is converted into cement from which seamless goods are produced on forms by the dipping process. These are vulcanized by simple immersion

[1] Data supplied by Faultless Rubber Co., Ashland, O.
[2] U. S. Patents Nos. 1,537,858, 1,537,859, 1,551,042, 1,569,662, and 1,732,944.

for 20 to 60 minutes in a prepared water bath maintained at about 200° F. This bath contains as accelerator A, either of the water soluble chemicals indicated, to the extent of ¼ part in 100 parts of water. The variation in the length of time required to complete the vulcanization depends both on the degree of vulcanization desired and on the thickness of the article being vulcanized.

### Apparatus

The moderate speed of curing and easily regulated temperature of the water bath are conditions that render the new method of cure much more satisfactory to operate. The apparatus required is nothing more than a heavy wooden tank of hot water. Across the tank the bars are laid from which the goods are suspended for the requisite time in the hot-water solution of the ultra accelerator.

In more recent practice the bars supporting the forms carrying the goods to be cured are detachably connected to an endless conveyer. By this means the products are carried submerged through the tank of hot water at such a rate that the goods are fully cured as they pass from one end of the tank to the other. This arrangement is easily regulated as to speed, eliminates much labor, and allows uniformity of cure.

The products cured by this method possess maximum tensile properties of the rubber and are free of liability to deterioration by overcure or by after curing effect. The high antiaging value of the accelerators used insures long life to the goods, which is in marked contrast to general experience with the acid cure.

## More About "Chondrilla"

In connection with the article on *Chondrilla* rubber that was published in India Rubber World, January 1, 1930, our readers will be interested in a quotation from a letter in the News Edition of *Industrial & Engineering Chemistry*, January 10, 1930. The writer points out that species of *Chondrilla* are found in the northeastern part of the United States; and that the genus is related to the dandelion and other plants which contain latex.

Gray's "Manual of Botany," for the northeastern United States, says that the name was used by Dioscorides for some plant which exudes a gum. Dioscorides, a Greek botanist, was born in the first century, A. D. In Britton's Manual it is said that the name *Chondrilla* is derived from the Greek word for "lump," from the gummy matter borne on the stems of some species.

In Wiesner's "Rohstoffe des Pflanzenreiches" is a short paragraph on *Chondrilla*. One species, *C. graminea*, which occurs in western Asia (Vorderasien), is said to contain a kind of caoutchouc called *Tschingel*. The authority for this is Bernardin's "Classification de 100 Caoutchoucs et Guttaperchas," published in 1872.

Wiesner also quotes a statement in a book by Böhmer, of which the date is not given, that sometimes in summer a material "very similar to gum elastic (Federharz)" is found on or beneath the roots of the European *C. juncea*. According to Scopoli, this material is called "aquarelle" in Pavia, a town in Italy. It is apparently formed by the exudation of latex, in which the plant is very rich, from wounded roots.

# How to Reclaim Rubber Tile

Allan Williams

VARIOUS methods are employed in laying rubber flooring, and methods of removing it likewise are different. On wood floors where the rubber has been cemented directly to the wood, the salvaging of the rubber will be a small percentage as the cement will adhere so firmly that the rubber tile will crack or tear, particularly if it has been laid for any great length of time.

Where felt has been used in the installation, all of the rubber tile can be taken up without breakage of any kind if a reasonable amount of care is used. The felt must then be removed by either an alcohol solution or a solution prepared for different kinds of cement. When the rubber flooring has been laid with felt and muslin, the same percentage of reclaiming can be had as when only felt has been used.

Other underfloors that require quite a great deal of cleaning are those made of asbestos and magnesite compositions. This type of underfloor scales and leaves a thin coat of the top surface on the bottom of the tile when taken up.

The cleaning of the rubber tile requires a great deal more time than the rubber tile would be worth if the rubber flooring is not in a fair state of preservation, and unless it can be relaid with not too great a variation in thickness, the idea of salvaging should be abandoned. This question can be quickly solved by an expert on rubber flooring by the following method. On wood floors the thickness can be determined by turning up the joints where the floor has been used the most. On concrete or composition floors the thickness of the rubber tile can be determined by a hammer and a small brad. Drive the brad into the rubber flooring until it strikes the concrete. Then withdraw the brad, holding it as close to the surface of the flooring as your finger nails will permit, thus showing the distance from finger nail to the end of the brad, which is the thickness of the rubber tile flooring, or the top surface of the flooring to the top surface of the underflooring. Where the rubber flooring has been used so the thickness is but ⅛-inch or less, where there are large scars or discoloring from alkalis or checking, salvaging would be useless and unprofitable, unless used with asphalt, tar, or the like for the manufacture of rubber pavement blocks.

Cleaning rubber tile has been the biggest obstacle in its reclaiming for use as flooring a second time. One method, invented recently, has proved very successful, is simple, inexpensive, and leaves not more than three per cent of the cement to be cleaned from the tile when removed from concrete floors. This method is as follows: Mix thoroughly a solution of flour and water with an addition of wood naphtha to a cream stage and spread over all the rubber flooring to the depth of not less than ⅛-inch nor more than ¼-inch, and see that no spot is uncovered. This should be done for three consecutive days and by that time the fermentation of the mixture of flour, water, and alcohol has caused the rubber tiling to release itself from the cement. The rubber flooring should then be cleaned off; the tile dipped in a cleaning water solution and wiped off with a dry cloth and left to dry out thoroughly.

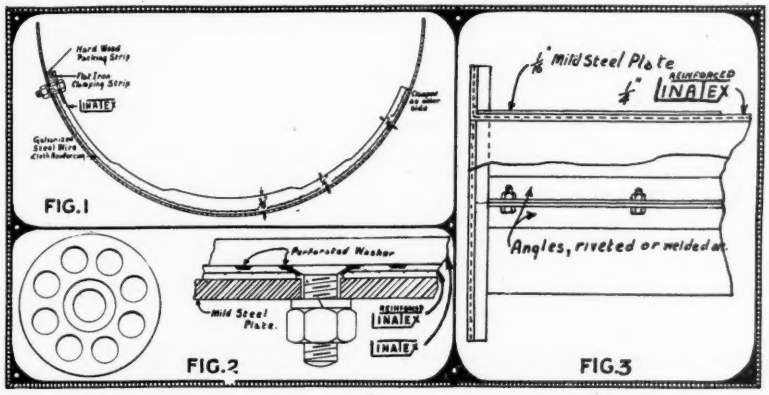
Soaking rubber tiling in an alcoholic solution causes the tile to expand and bring new life in the elasticity, but if one does not know the amount of genuine rubber in its ingredients or to what pressure per square inch the tile was subject when made, he may cause more harm than good, as some rubber floors on the market are not much better than an asphalt composition with very little rubber and substitutes.

This article applies to the better grade of floors where quality is up to the standard and the guarantee of the manufacturer stands behind the product.

# Creped Rubber Liners Outwear Steel

## *Remarkable Durability Reported for Rubber Liners Used in the Mining Industry for Crushing Rolls, Pulp Launders, and Ore Skips*

THAT rubber lining for chutes, launders, and sand pumps, piping, grinding mills, and other hollow apparatus used in the handling of crushed minerals, especially when carried in a water current, is much more lasting and efficient than even the toughest alloy steel lining has been known for several years by engineers in mining and cement industries. In their search for available material experimenters, after trying nearly everything from soft raw plantation rubber to the toughest kind of cured tire tread, had about agreed that the most suitable material should be a soft, tough, pliable, fairly smooth, vulcanized stock. Now it is claimed that the specially compounded, heat-cured material is even outclassed for many uses by what is known as Linatex,[1] a chemically-treated latex product resembling sole crêpe, its wear resistance being attributed more to extreme resilience than to great toughness, although it appears to have its share of the latter quality.




**Applications of Rubber Linings to Mining Machinery**

### Not Compounded or Heat-Cured

This material is said to be quite unlike all other liners chemically, physically, and mechanically. Of a brick-red color, fairly translucent, it is said to contain 95 per cent of freshly-coagulated latex, pure and well-dried, and is machined like other good quality rubber. In both the chemical treatment and the sheeting and laminating it is claimed that great care is taken so that the rubber's nerve or gristly texture, resiliency, and durability are not impaired as so often happens in the preparation of rubber for compounding and heat vulcanization. While it can not be molded, it is said to have advantages which molded rubber may often lack. It is non-spreading, functions well in cold weather and tropical temperature, resists sunlight, salt water, and ages better than most vulcanized rubber. On a stone chute coated with it the sharp particles do not slide as on a metal-lined chute but are bounced back into the moving mass as soon as they hit the crinkly surface; and in a launder or conduit carrying sand and water the rubber liner prevents sand from scraping through its recoil effect in forcing the grit back into the stream.

A special advantage claimed for this material is that, unlike vulcanized rubber, it can be readily built up into any shape or thickness with a special cementing solution. Such work, as well as the attaching of the primary liner can be done by easily-trained workmen where machinery is installed. Reenforcing is provided by inserting between the laminations steel-wire cloth of various weights depending upon the strength and thickness required in the liner's applications. For special cases fabric or open-cord weave is used for reinforcing. The reinforcement prevents stretch and deformation and helps in securely fastening the liner.

The mode of lining an oversize steel tailings chute from the revolving screen of a mining dredge is shown in Figure 1. Liners such as this have been built up in 4 by 90-foot sections ready for laying. In the liner illustrated the foundation or wire-strengthened rubber was 3/8-inch thick, and affixed longitudinally to it with solution was a narrower layer of plain sheeted stock, on which was superposed a still narrower strip of the same stock, the latter giving the liner a 3/4-inch thickness along the final strip. The upper layers are skived before being attached. The liner was positioned to the chute's steel wall with the aid of hardwood packing strips abutting the liner at either side, and overlaying the joint was a flat iron clamping strip. Bolts were passed through the iron strip, securing the wood strip and the rubber liner to the shell of the chute. It is explained that the thickening of the liner in the manner mentioned was not done to provide more rubber to wear away but to afford requisite resilience in resisting or practically preventing wear of the rubber.

### Sub-Surface Bolting

Attachment of rubber lining to a steel plate so that bolts may be protected from wear is effected by countersinking the beveled bolt heads in reenforced rubber and using a special perforated washer into which the liner locks itself and which

[1] Linatex is made by the Wilkinson Process Rubber Sales Co., 14th Place and Canal Street, Chicago, Ill.

also prevents the bolt head from turning. This arrangement with the covering layer of unreinforced rubber lining is shown in Figure 2. This affixing method is advised where the liner must resist a heavy dropping discharge, as from some types of mining dredges; where it is desired to fasten rubber to vertical plates; to secure a liner more firmly at the head of a long sloping chute or launder; where the means of attachment must be protected from wear; or in lining a tube mill. Regarding its use in mills, it is stated that this lining may not be available in countries where patents for rubber lining are claimed to cover every type of rubber material.

The sub-surface bolting method may be used for attaching and building up a rubber liner in a gravel or sand pump casing, although other methods may be used owing to the ease with which the lining may be joined and built up. In Figure 3 is shown how a steel or iron pipe split lengthwise may be lined with rubber. When the reinforced layer is carried in one piece to the outside of the liner flange, the attachment of the flange to the pipe liner may be made as strong as the liner itself. Equally easy is the lining of a steel launder of rectangular section, the reinforced rubber being readily bent to fit the inner contour, suitably thickened with strips, and bolted as in the case of the dredger chute.

### Economical Operation Claimed

Chutes and mills thus lined are said to be much cheaper to operate; for being less heavily weighted than those with steel lining, they require much less power for operation; and lining renewal can be done with but little delay and without the cost of sending parts away and halting work for perhaps a long period.

In a year's severe test of the rubber compared with cast-iron and steel liners, the material carried being slimes and sharp ore such as found at the Malayan tin mines, the ¼-inch liner, having a square foot weight of 1¼ pounds and costing $2.14 (F. M. S. currency), it is said, wore but 2.13 per cent at a square foot cost of 4½ cents; while the ¾-inch metal liners having a square foot weight of 30 pounds and costing $3.01 wore away 56.93 per cent at a square foot cost of $1.72. Thus annual cost of rubber is figured at less than 1/12 that of cast liners, giving the former eighty times the life of cast liners of equal thickness.

## Nitrogen for Tire Inflation

EDWARD SCHULTZ

Notwithstanding the great developments that have contributed to the perfection now embodied in pneumatic tires and inner tubes, they are still inflated by atmospheric pressure.

However, a little analysis reveals that ordinary air is far from being the ideal inflator for tires. Excluding such non-important constituents as argon, neon, hydrogen, helium, xenon, and carbon dioxide, air roughly consists of 79 parts nitrogen and 21 parts oxygen. Although oxygen forms but about one-fifth of atmospheric bulk, it more than makes up for this by its activity or readiness with which it enters into a chemical combination.

The hardening and decomposing effects of oxygen on rubber are well known. It is promoted by heating, and this condition exists in a tire when it has run for a considerable distance, especially when used under hot-weather conditions. When inflated, an inner tube is stretched so that the pores of the rubber are expanded, thus giving the oxygen a chance to penetrate more easily into the rubber. Whenever atmospheric oxygen is present in the form of ozone, the destructive effect of this highly active and unstable gas cannot be overestimated.

Turning now to the 79 parts of nitrogen of which air is composed, it would seem that this constituent, at least, would have a neutral effect on rubber. But not necessarily, for free nitrogen, as it exists in the air, is likely to be in the form of activated, atomic or allotropic nitrogen, so transformed by electrical discharges in the atmosphere. In this state it readily effects the decomposition of hydrocarbons such as rubber. When nitrogen is commercially pure, however, it is a most inert and neutral gas and is, therefore, the ideal inflator for motor vehicle tires or tubes.

## Dismissal Wage Policy Humane and Successful

"The United States Rubber Company is now paying a dismissal wage when, due to reorganization, a factory is permanently closed or a process definitely discontinued," declared Miss E. H. Little, assistant supervisor of industrial relations, U. S. Rubber Co., before the Personnel Conference of the American Management Association held in Cleveland, O., on January 31. "The dismissal wage is paid on the basis of one week's pay for each year of employment to persons with fifteen years of service and to those forty-five years of age with ten years of service. In closing four factories, 502 persons have benefited, in amounts varying from $125 to $2,000.

"Under modern methods of conducting industrial enterprises, running a factory is no simple endeavor, but to shut it down permanently in a well-ordered and efficient manner is a far more difficult task. Even with our American notions of mobility, a factory of any size represents an institution in the local community. Its closing means the breaking of old associations, the scattering of families, and very generally results in radical readjustments for everyone intimately concerned. . . . To no group is the shock greater than to the middle-aged group of long-service workers. They are anticipating many more years of employment; learning a new job is beyond their imagination; and even a change in the location of their work is looked upon with dread.

"Two parts of the policy which we have adopted in closing factories have proved their value as shock absorbers. One is the month's notice, and the other is the dismissal wage. The beneficiaries of the latter are largely this middle-aged group. The month's notice provides for mental readjustment, and the dismissal wage, in some measure, for economic readjustment, and the mental readjustment is an important factor in making the economic readjustment. . . . With the loss of a job staring everyone in the face, a dismissal wage is a very tangible evidence of a company's appreciation of loyalty and service. Our experience has been that not only the direct beneficiaries respond to that appeal, but they also carry along with them those others whose leaders they naturally are. It is a potent force in forming public opinion within the plant. The result is a fostering of pride and morale under circumstances where indifference and demoralization would be normal."

## Appropriations Asked for Studying Production of Rubber

Included in the recent recommendations to the Senate by the Senate Agricultural Committee as part of the money to be made available for the United States Department of Agriculture for the fiscal year 1931 was a fund of $20,000 for investigations concerning production of rubber from the *Hevea* tree. This study will consider the feasibility of attempting to produce rubber from such trees in Florida, the Canal Zone, Central America, and the West Indies. This increase brings the appropriation for the investigations of rubber by the bureau up to $160,000.

# The Manufacture of Machine Dipped Goods

EDGAR MAASS, PH.D.[1]

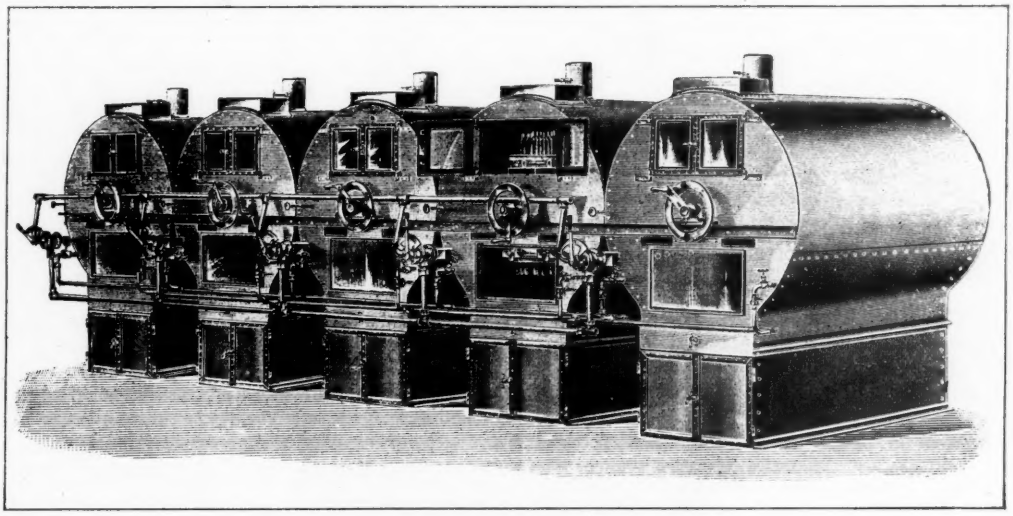


Fig. 1. Battery of Five Enclosed Dipping Machines

THE manufacture of thin seamless pure gum rubber goods such as gloves, balloons, finger cots, etc., by the dipping method followed the invention of cold curing or acid process of vulcanization. Dipping is done generally by hand-operated dipping machines although at least one successful power-operated machine is known. In any event the process is carried on in warm rooms with free circulation of air. The method is conducted in the following manner:

A number of glass, wood, or porcelain forms supported in a frame are dipped into a rubber cement consisting of a mixture of rubber and volatile solvent. The forms have the shape of the article to be produced. After the forms are withdrawn from the cement, they are exposed to warm air, thus evaporating the solvent and leaving a thin coating of rubber on the form, which is dipped repeatedly until the coating attains the desired thickness. After the article has been dried thoroughly on the form, a bead or ring is fashioned around the open end of the article by rolling the coating back upon itself. It is then ready for curing, which is accomplished by dipping it while on the form into a solution of sulphur chloride. This exposure is a matter of seconds only, curing the outer surfaces of the article and penetrating sufficiently to permit its removal from the form. After that the cure is completed by applying sulphur chloride to its interior surfaces.

Though hand-procedure seems simple enough, this dipping process in practice is very complicated and seems to evade mechanical control. No other process in the rubber industry requires more patience and experience. Its greatest difficulty exists because the dipping cement is neither a pure solution nor a mere mixture, and by the slightest change of raw materials or working conditions the cement alters in an astonishing degree with regard to its physical properties.

The difficult control of the process requiring skilled help, besides the constant danger of fires on account of the volatile solvents, probably explains why the dipping industry has always been rather a neglected offspring of the general rubber industry. The dipping process has been operated by many small plants, the owners and managers of which applied old hand-methods and rule of thumb practice in their work, never realizing that a sound development of methods and machinery could help them considerably. This is the more surprising as the dipping process is originally an American innovation. Only recently has this business been modernized in keeping with other branches of the rubber industry by the introduction of a machine method. Due to this development consolidation is occurring in this as in other progressive branches of industry. The number of plants is decreasing while their size and output are constantly increasing.

For making dipped rubber goods one should use the best crude rubber available, such as, first latex crepe or upriver fine Para. The latter grade is used exclusively for the better balloons and gloves. Keen competition has led some manufacturers to buy cheaper raw materials. This seldom pays because increased waste and inferior quality are the inevitable results of such false economy.

Either benzol, toluol, or naphtha is used as solvent for the rubber in making dipping cement. Benzol is by far the most satisfactory, but because of the cheaper price the American manufacturer prefers naphtha, very good grades of which are on the market. Benzol fumes are very poisonous

[1]Consulting Chemist, West Paterson, N. J.

and, therefore, benzol may be used only in enclosed dipping machines. One of the best naphthas is Dip-Sol, which boils between 195° and 310° F. An initial boiling point of below 170° and an end boiling point of above 330° F. are dangerous. When the boiling point is too low, there is danger of blistering the goods by too rapid and uneven evaporation. When the boiling point is too high, evaporation is too slow and expensive. Also small traces of kerosene may remain in the goods, causing an odor and rapid deterioration. Of the different grades of benzol the best is the commercial 96 per cent, which is far cheaper than the pure benzol and does not evaporate so quickly at one point. A mixture of two-thirds naphtha and one-third benzol is highly recommended, especially for the enclosed dipping machine. The boiling points should always be tested as soon as a new shipment of naphtha or benzol is received.

Rubber well plasticized on the mill forms cement much quicker than unplasticized rubber. In most cases the rubber is milled at a temperature entirely too high. The mill must be cooled with water in order not to impair the life of the gum. The rubber, after milling, should rest over night and be milled a second time before it is put into the cement mixers for solution.

Both horizontal and vertical mixers are used for cement mixing. The horizontal type is better for heavy cement; the vertical type for thin cement. Mixing is conducted at room temperature and should not be interrupted until the mixture is free of lumps. It will save considerable time if the rubber is put into the mixer in small pieces. When a mixer is stopped during the process, lumps of rubber may stick to the mixing blades, thus making it difficult to start the mixer again. When the cement is taken out, it should be strained through cheesecloth to remove lumps and dirt.

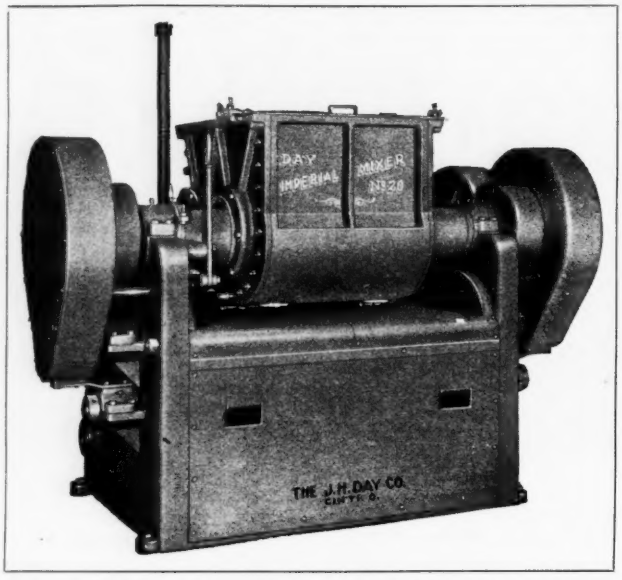



**Fig. 2. No. 20-A Imperial Mixer, Tank Jacketed, Working Capacity 40 Gallons**

Freshly made cement cannot be used at once. It is pumped into a large tank, preferably of stainless iron, where it should remain to age for at least a week. Although the aging process means for the manufacturer investing additional money for space and materials, it is profitable and should be practiced more generally.

During aging, the cement changes considerably: its viscosity gets higher and more uniform throughout. Possibly more of the rubber goes into pure solution. An aged cement works much easier and produces goods of uniform appearance and thickness.

The aging tank should be located above the dipping room so that the cement can slide into the dipping tanks by gravity. In this way fewer air bubbles will enter the dipping tanks, and the operation of dipping can begin a few hours after the tanks have been filled.

Most of the dipping in the United States is done by hand in tanks about 16 feet long by 4 feet wide for thin articles and in smaller tanks for heavier articles. The forms are supported in an iron frame above the tank and can be lowered or raised. A mechanical spindle device enables the dipper to proceed very slowly as soon as the forms touch the cement. The use of open machines has several disadvantages. The operators work in an atmosphere of naphtha vapors, which not only endanger their health but lessen their efficiency. The work is mostly hand work depending entirely on the operator's skill. The entire dipping room has to be raised to a temperature of about 90° F. That means much expense for steam and a reduction in the activity of the help. All naphtha evaporated from the forms and the tanks is blown into the air and lost. If air conditioning is applied, the whole dipping room has to be considered. That involves larger units and higher costs of refrigeration, heating, and ventilating.

These hand-machines have one advantage, which probably accounts for their general use in the United States. The frames, boards, and forms are easy to handle because the dipper has free access from all sides of the tanks. He can also better watch the cement and quickly discover any disturbance like the rising of blisters or the formation of rubber skins on the dipping surface. Open units are larger and are perhaps better fitted for mass production though there is no reason why the enclosed machine could not be built larger.

About 30 years ago the first enclosed dipping machine was constructed in Germany and has been progressively developed ever since. Machinery of this type is used in Russia, Japan, South America, and all over Europe. Possibly it has not yet been developed fully to the standards of American mass production, but without doubt the enclosed type is superior to the open type even in its present form. Figure 1 shows five machines of the enclosed type. The machine is built of heavy sheet iron and consists of two parts. In the upper cylindrical part a shaft rotates and carries either two or four iron frames. These can be removed through the doors visible in the upper section of the machine. In the lower part is the space for the dipping tank which can be removed through the bottom door. The machine is fitted with windows through which the dipper can closely watch the operation. Instead of raising or lowering the frame by a hand-spindle, the dipper raises or lowers the tank by hydraulic pressure. The tank is covered by two sheets of metal which close and open mechanically. The ventilating air enters the machine through the little chimney on top and leaves it laden with the fumes of naphtha through an opening in the rear. Temperature and ventilation are controlled by steam and air valves located on the front of the machine. One dipper can easily handle 8 to 10 units. A single machine has space for about 3,000 nipple forms or 2,000 forms of pouches, gloves, or balloons. Special large machines are used for the production of long obstetrical gloves and rubber stockings.

A pump and an accumulator are used to produce oil hydraulic pressure. The accumulator is loaded with iron plates to raise the working pressure to the amount necessary to give the tanks a steady movement. The pressure pump is regulated automatically by the movements of the accumulator. The oil used in the system must be free of paraffins, and its

(*Continued on page 66*)

# Power and Stretch of Belting

AN instructive study on the transmissive power and stretch of belting has been published by the Ohio State University.[1] This research presents unbiased engineering data on belting of various materials. These included canvas-stitched, mineral-tanned, and oak-tanned leather, balata-duck, and rubber-duck construction.

Facilities for making tests on running belts were provided in the laboratory of the mechanical engineering department. The apparatus used is shown in Figure 1. The letter *A* denotes a dynamometer of 20 h.p. capacity and a speed range up to 2,000 r.p.m. The letter *B* indicates a motor of 12 h.p. capacity and a speed range from 500 r.p.m. to somewhat over 1,000 r.p.m. This motor is mounted on roller bearings *C* running on a track *D*. The belt tension is adjusted by screw *E* and handwheel *F*. It is measured by means of bell crank *G* resting on platform scale *H*. The whole arrangement proved quite sensitive. A light touch on the belt was sufficient to move the motor and change the scale reading.

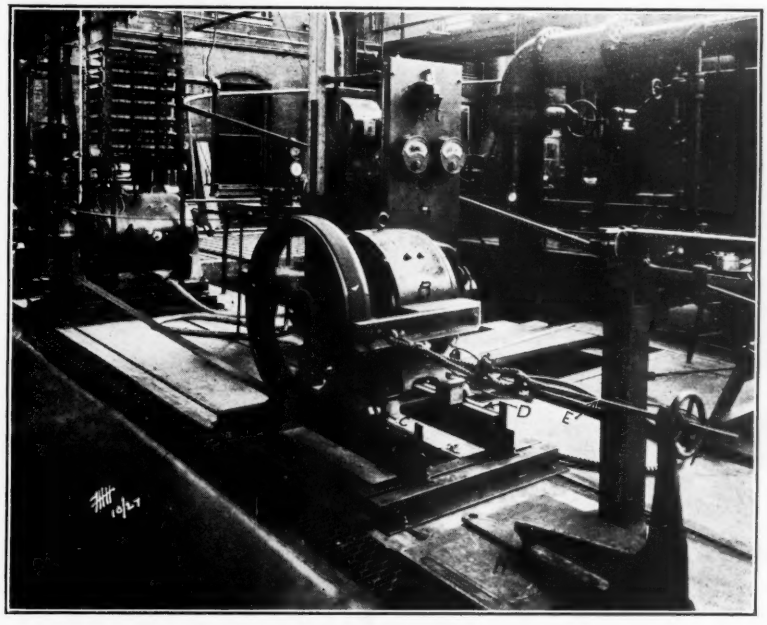



**Fig. 1. Belt Testing Apparatus, Mechanical Engineering Laboratory, Ohio State University**

The results of the tests proved that mineral-tanned leather belting has a higher pulling efficiency than any other belting. Balata belting came second, followed by rubber, third, impregnated canvas, solid woven, fourth, and oak-tanned leather, last.

In regard to the slippage of belting in service it should be noted that each material exhibits this characteristic, and that there is no such thing as a belt without some slippage. The slippage of mineral-tanned belting is shown in Figure 2 in which the vertical scale represents the tension ratio of the belt. In other words the ratio of the tensions of the tight side to that of the slack side is expressed $T_1 \div T_2$.

In the case of mineral-tanned belting this ratio rose to 22. The maximum tension ratios of the other beltings were all very much lower. On account of elasticity, belting of every kind "creeps." Most belt users make no distinction between creep and slip, and none is made by the authors in their report.

[1]Engineering Experiment Station Bulletin No. 41, by C. A. Norman and G. N. Moffat.

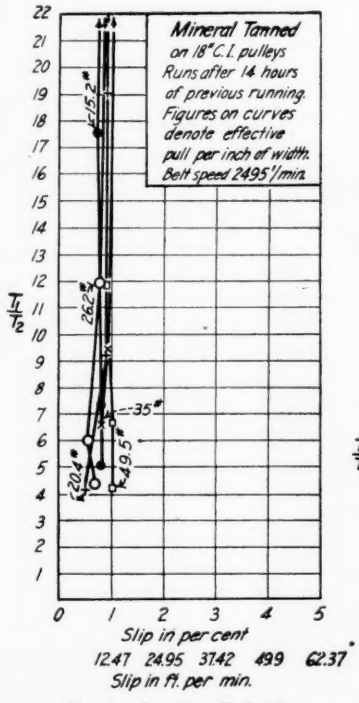



**Fig. 2. Leather Belt Test**

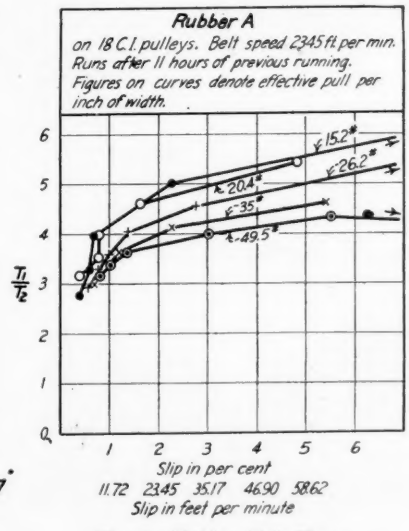

Rubber A
on 18 C.I. pulleys. Belt speed 2345 ft. per min.
Runs after 11 hours of previous running.
Figures on curves denote effective pull per
inch of width.
T1/T2
Slip in per cent
11.72 23.45 35.17 46.90 58.62
Slip in feet per minute

**Fig. 3. Rubber Belt Test**

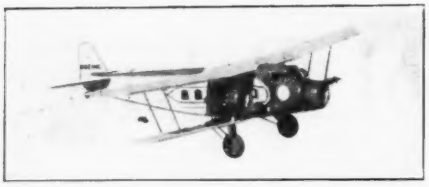
The best diagram for rubber belts is shown in Figure 3. These curves slope nearly to horizontal and begin with a slip of only 0.5 per cent at a tension ratio of 3. At 1 per cent slip the best pull shown by a rubber belt is at tension slightly above 4. As soon as this ratio is passed, slip rapidly increases, and the curves become flat. In practice, therefore, it is best to run rubber belts with a tension between 3 and 4.

Balata belting is reported as behaving remarkably well under certain conditions. It ran very slack but not with the extreme slackness possible with mineral-tanned belting. The test curves for balata belting vary from vertical to nearly horizontal.

Hair belting also gave decidedly erratic curves, operating with a maximum transmission ratio of 10. The results of the tests prove that hair belting does not perform so well when new as when "run in."

Solid woven cotton belting at maximum

(*Continued on page 66*)

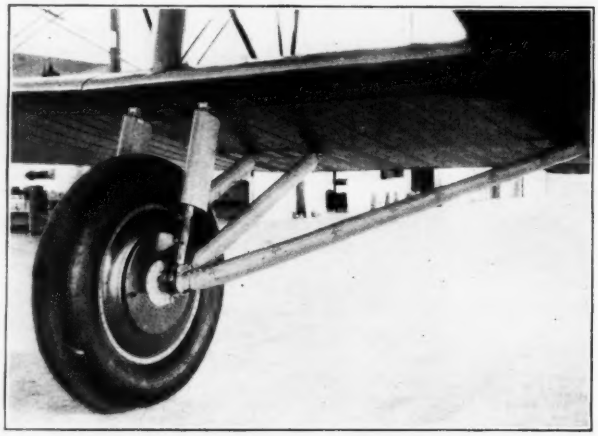


# Rubber's Role in Aviation[1]

PEGGY CARVER

AS AIRPLANES blaze new trails to increase the already extensive mileage of established air routes in this nation, and as air travel grows in popularity with the public, the aviation industry in this country is becoming an increasingly important market for rubber products. The most important of these, of course, are tires and tubes.

With the volume of passenger traffic over air lines steadily growing, aircraft producers are building planes with larger passenger-carrying capacity, and tire manufacturers are being called upon to produce airplane tires of correspondingly larger sizes. The largest airplane factory in the United States is completing production on a fleet of twelve 18-passenger tri-motored transports, designed primarily for a passenger service over a 2,000-mile air-mail-passenger route between San Francisco Bay and Chicago. The requirements for airplane tires for these large planes were unusually strict, for the total weight of one of the transports is 8¾ tons.



**54 by 12 Airplane Tire on Modern Passenger Transport**

Sturdy construction is an essential feature of an airplane's landing gear, because of the force of the impact when the plane's wheels strike the runway as the landing is made. The impact of the average landing often exceeds the total weight of the airplane.

Department of Commerce specifications require that the landing gear of an airplane be constructed so as to withstand an impact four times the weight of the completed airplane in case of an 18-inch free drop, that is, if the airplane were to be dropped 18 inches to the ground without appreciable forward motion or braking. Such an impact naturally places great strain on the tires, and the regulation materially increases the requirements for airplane tires. The engineers at the afore-mentioned factory exceeded the factor specified by the Department of Commerce, and built the landing gear for a five to one factor. In other words, were the big plane to be dropped 18 inches to the ground, the landing gear would be able to withstand an impact of more than 43 tons, for the total weight loaded of the transport is 17,500 pounds.

Sturdy 54 by 12 airplane tires, produced by the Firestone, Goodyear, and Goodrich rubber companies, are used on these transports and are carried over the 2,000-mile transcontinental airway that crosses mountains, deserts, and plains, and includes flight elevations ranging from sea level to 12,000 feet. Forty-five planes in all are used in Boeing System operations and are flown 10,000 miles every day over the transcontinental and Pacific Coast routes, or one-eighth of the total commercial air mileage in the nation.

Many other rubber products enter into the construction of airplanes. For example, fuel and oil lines in such planes have rubber hose connections, and although this may seem a small item, it is estimated that nearly 3,000 feet of rubber hose are used every year at one plant for this purpose alone.

An interesting use of rubber is found in the flotation bags for Navy planes. These balloon-like bags, placed in the wings of the Navy airplane-carrier planes, may be inflated in case the planes, which are equipped with wheels for deck landings, are forced down over the water. The inflated rubber bags prevent the planes from sinking.

Quantities of rubber are used in numbers of ways in commercial plane construction also. Thick rubber matting covers cabin floors; windshields are sealed with rubber packing; bumper blocks are made of rubber; rubber grommets are used in the fire walls of the planes.

Rubber products manufacturers are finding that the airplane is not only furnishing a substantial market, but, as an agency of transportation and communica-

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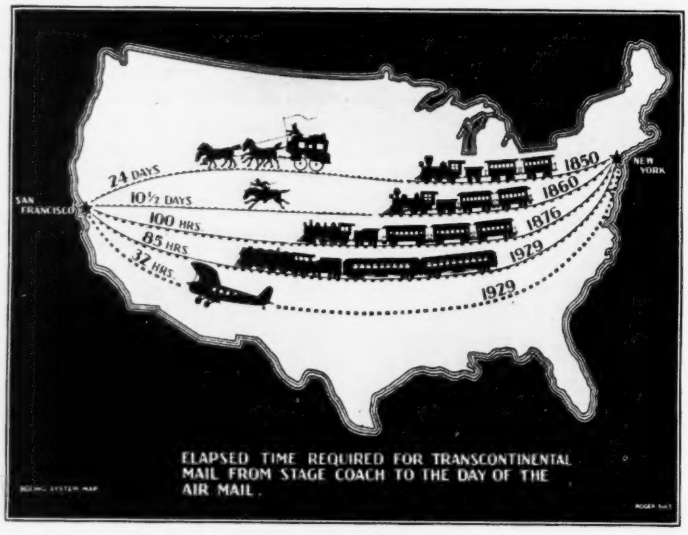



**Time Travel Map of the U. S.**

[1]Data and photographs from Boeing Air Transport, Inc., Seattle, Wash.

# Uses of Rubber Latex

THE following abstracts of United States patents relating to the various uses of rubber latex are continued from INDIA RUBBER WORLD, November 1, 1929.

1. Bishop, 73,287. Jan. 14, 1868. Paper is coated with latex and passed between calender rolls.

2. Morisse, 859,611. July 9, 1907. Latex is poured into molds and coagulated by a solution of beech creosote and guaiacol in alcohol.

3. Defaucamberge, 943,658. Dec. 21, 1909. Latex is mixed with a solution of viscose; the mixture coagulated by fixation baths; the product washed and vulcanized.

4. Poizot, 963,806. July 12, 1910. Sponge rubber is made by mixing latex, rubber, sulphur, fillers, and ammonia and vulcanizing at 130° C.

5. Schidrowitz and Goldsbrough, 1,156,184. Oct. 12, 1915. Sponge rubber is made by coagulating latex under conditions producing a spongy coagulum, and fixing the pores by vulcanization by means of vulcanizing agents which are added at any suitable stage of the process, the coagulation being brought about during the vulcanization.

6. Schermerhorn, 1,204,697. Nov. 14, 1916. A protective coating composition consisting of latex 20 per cent, benzene 15 per cent, ether 25 per cent, rye flour 20 per cent, and plumbago 20 per cent.

7. Brick, 1,341,782. June 1, 1920. The sheets of a tablet are united with an adhesive consisting of fine Para rubber, latex, inert fillers, calcium hydroxide, coloring matter, and a deodorant.

8. Hopkinson, 1,411,786. Apr. 4, 1922. Fibrous material is combined with latex, eliminating water prior to vulcanization, applying a layer of crude rubber containing sulphur to the material, and vulcanizing.

9. Hopkinson, 1,424,020. July 25, 1922. Weftless fabric is made by immersing cords in latex, maintaining the coated cords in parallel relationship, passing them over a drying drum, driving off the moisture from the coated cords and forming an unwoven sheet of parallel cords joined together by rubber.

10. Biddle, 1,437,487. Dec. 5, 1922. Reissue 16,476 and 16,477. Nov. 16, 1926. An adhesive composition comprised of latex, casein, and an acid salt adapted to coagulate the mixture.

11. Schidrowitz, 1,443,149. Jan. 23, 1923. Latex is added to an alkaline polysulphide; the mixture vulcanized; the rubber separated from the vulcanized aqueous product.

12. Moses, 1,489,330. Apr. 8, 1924. A paper sheet of high porosity is formed having loosely matted long fibers, coating the individual fibers with latex, and condensing the sheet by pressure.

13. Hopkinson, 1,491,265. April 22, 1924. Latex is mixed with a filler and chlorinated, ground rubber and a pigment, adapted to be molded under heat and pressure.

14. Gardner, 1,492,027. Apr. 29, 1924. Protective coating compositions are prepared by separately treating latex and a pigment capable of coagulating latex with an alkali and mixing the resulting latex and pigment.

15. Kaye, 1,500,500. July 8, 1924. Latex is added to paper pulp; the mass mixed to disseminate the latex between the particles of the pulp; the mixed mass passed through a paper making machine; and the resulting paper vulcanized.

16. Schidrowitz, 1,502,686. July 29, 1924. The manufacture of rubberized paper comprises compounding together paper ingredients and aqueous vulcanized rubber and coagulating the vulcanized rubber *in situ* upon the ingredients.

17. Marshall, 1,506,317. Aug. 26, 1924. Rubberized fiber is made by incorporating latex with paper pulp, coagulating the latex, making the product into paper, which is impregnated with rubber latex, treated with a coagulant, then dried and hydrated.

18. Glancy, 1,518,062. Dec. 2, 1924. A rubber shoe formed of crepe rubber having a latex rubber lining.

19. Marquette, 1,519,547. Dec. 16, 1924. A lubricant for preventing adhesion of rubber surfaces during vulcanization comprising liquid latex, mica, and ammonia.

20. Gish, 1,519,729. Dec. 16, 1924. A puncture proof tire having an inner layer consisting of coarse Para rubber, first latex rubber, mineral rubber, rubber solution, and sulphur flour.

21. Hopkinson, 1,526,984. Feb. 17, 1925. Sheet material is made by continuously prearranging fibers to form a sheet which is treated with latex and dried.

22. Schapiro, 1,529,322. Mar. 10, 1925. A match composition, having ignitible ingredients compounded with latex and a vulcanizing ingredient, the vulcanization taking place at the normal temperature of the air.

23. Andrew, 1,534,676. Apr. 21, 1925. Material is formed from fibers by forming the fibers into yarn, passing it through hot water then through an anti-coagulant for latex and finally through vulcanized rubber latex prior to further treatment of the yarn for the formation of the material.

24. Moses, 1,535,940. Apr. 28, 1925. A web of paper is wet with latex and passed between presser rollers operating at different surface speeds.

25. Fuller, 1,539,253. May 26, 1925. A sanitary shield for dental instruments comprising a tube of at least two layers of long fiber paper united by latex.

26. Hopkinson and Gibbons, 1,542,388. June 16, 1925. A deposit of rubber solids is continuously built up on a form in contact with a body of latex; the moisture withdrawn from that portion of the latex in contact with the form; and the article dried and vulcanized.

27. Loomis, 1,543,932. June 30, 1925. Sulphur in colloidal form is introduced into the latex, and subsequently vulcanized.

28. Mayer and Montgomery, 1,545,005. July 7, 1925. A vermicide containing 62 to 68 parts of a resinous body, 24 to 28 parts of substantially pure fatty acid free from a glyceride, and 4 parts of latex.

29. Hopkinson and Gibbons, 1,545,257. July 7, 1925. A thread, tubing, strips, and similar articles are made by continuously passing a stream of latex through a nozzle into a coagulant, coagulating the stream to form a solid rubber mass continuous with the stream, and continuously drying the rubber mass.

30. Deventer, 1,548,776. Aug. 4, 1925. Objects are preserved by coating them with latex to form an air-excluding film thereon.

31. Brandt, 1,550,670. Aug. 25, 1925. Dynamite cartridges are made from latex treated paper.

32. Gibbons and Koenig, 1,551,553. Sept. 1, 1925. The manufacture of tubing consists in streaming latex into a coagulant, forming tubing containing a latex core, closing the tubing at intervals and severing it to form lengths thereof, removing the lengths from the coagulant, confining the lengths externally, and removing the latex core with fluid under pressure while the lengths of tubing are confined.

33. Loomis, 1,552,625. Sept. 8, 1925. Molded fiber articles are made by treating fiber with latex, partially coagulating and molding the articles.

34. Meyer, 1,561,942. Nov. 17, 1925. Unvulcanized rubber articles are spliced by severing the unvulcanized rubber, coating the freshly exposed surfaces with latex and joining the surfaces.

35. Weiss, 1,563,410. Dec. 1, 1925. The method of incorporating rubber in paraffin wax comprises the addition of latex to the paraffin wax at a temperature of substantially 120° C. and heating and stirring until the water has been expelled from the mixture.

36. Taylor, 1,566,566. Dec. 22, 1925. A cement consisting of latex, furfural and mono-chlor-naphthalene and tri-chlor-naphthalene.

37. Hopkinson, 1,567,646. Dec. 29, 1925. The manufacture of rubber and paper comprises combining with alkaline pulp a quantity of alkaline-preserved latex, agglomerating the mass, subjecting it to further mixing, then coagulating and forming the mass into sheets.

38. Norris, 1,567,747. Dec. 29, 1925. A storage battery separator comprising rubber latex.

39. Hopkinson, 1,570,895. Jan. 26, 1926. Tubing is made by passing a stream of rubber latex through an opening adapted to form a tube, coagulating the latex to form a tube, supporting the walls interiorly by a liquid coagulant, and drying the tube.

40. Russell, 1,573,093. Feb. 16, 1926. A tennis ball composed of sections of vulcanized rubber covered on one side with precipitated latex solids, and of a cloth covering impregnated with precipitated latex solids.

41. Johnson, 1,574,896. Mar. 2, 1926. Fabric consisting of a sheet of felt made from cattle hair, impregnated with a binder containing as its major constituent an adhesive, a smaller proportion of latex, and a penetrating oil.

42. Loomis, 1,576,767. Mar. 16, 1926. Pipes are protected by coating them internally with latex and coagulating it to form a rubber coating.

43. Munroe, 1,578,344. Mar. 30, 1926. A laminated building board, the layers of which are united by rubber latex and casein adhesive.

44. Venosta, 1,579,169. Mar. 30, 1926. Seamless rubber goods are made by dipping a form into latex to which sulphur and a metallic oxide have been added, evaporating its water content, introducing into the film thus obtained an accelerator by absorption from the external surface, and vulcanizing.

45. Russell, 1,579,890. Apr. 6, 1926. The method consists in impregnating fibers with rubber latex while the fibers are undergoing a felting operation, coagulating the latex, pressing and drying

the resulting material, and molding the material while the rubber is plastic.

46. Hopkinson and Dewey, 1,582,219. Apr. 27, 1926. A container closure provided with a sealing material deposited thereon, comprising latex.

47. Sheppard and Beal, 1,589,325. June 15, 1926. The process of electrodepositing rubber upon fabrics of non-conducting material comprises removing anti-wetting substances from the fabric, associating therewith a size containing a hydrophilous colloid having a pH value greater than 3 and less than 7, and bringing the sized fabric into contact with latex and passing current through the latex with the fabric adjacent the anode.

48. Cutler, 1,591,018. July 6, 1926. A composition of granulated cork is made with latex without coagulation, subjecting the mixture to pressure while coagulation of the latex proceeds.

49. Cutler, 1,592,445. July 13, 1926. Crepe rubber shoe soles are made by forming a cavity in the crepe rubber sole, filling the cavity with a mixture of granulated cork and uncoagulated latex and subjecting the mixture to pressure while coagulation of the latex proceeds.

50. Klein, 1,597,602. Aug. 24, 1926. A transfer consisting of a layer of paper and a superimposed layer upon which the picture is printed by means of colored latex mixture.

51. Lahey, 1,597,808. Aug. 31, 1926. The production of plastic composition comprises refining the rubber by grinding on a mill, then milling the refined rubber and adding latex during the milling operation.

52. Maurice and Frost, 1,597,860. Aug. 31, 1926. A substitute for gut and other animal fibers of a like nature is made by treating threads of natural silk with a solution of gelatinous substance and rubber latex, twisting the threads of silk together while the solution is moist and treating them with formaldehyde to render them waterproof.

53. Loomis and Stump, 1,599,282. Sept. 7, 1926. The process comprises partially coagulating latex to plastic form, spreading upon a fibrous sheet, and extracting the moisture to convert the material into rubber.

54. Curtis, 1,605,649. Nov. 2, 1926. Haircloth is prevented from raveling by impregnating it with latex, drying, and vulcanizing at temperatures not injurious to the haircloth.

55. Moses, 1,605,899. Nov. 2, 1926. A laminated sheet comprising rubber-united plies, part of the plies of which are of paper and part of unspun fiber, and throughout all the plies there is a substantially uniform distribution of the solid constituents of latex.

56. Lough, 1,607,266. Nov. 16, 1926. A breaker strip consisting of interwoven cord elements forming a diamond-shaped mesh, the diagonals of which mesh are shorter lengthwise than crosswise the strip treated with latex.

57. Schavoir, 1,608,243. Nov. 23, 1926. A fabricated cork sheet having a facing of finely granulated cork and a binder containing latex, an accelerator, an adhesive, a mixture containing a resin and an oil, and a vegetable gum.

58. Lefebure, 1,610,864. Dec. 14, 1926. A mass of hardened cementitious material is produced by mixing together a liquid setting cement, finely coagulated rubber latex, and a vulcanizing agent, thoroughly incorporating the materials to produce a pasty mass, giving it the required form, and vulcanizing the rubber.

59. De Cew, 1,621,399. Mar. 15, 1927. A paper product having the fibers uniformly coated with a mixture of aluminum hydrate and latex.

60. Sveen, 1,622,474. Mar. 29, 1927. Paper is produced by incorporating into dilute paper pulp containing a mordant and being in the condition ready to be passed on to the wire cloth of the paper machine, a small proportion of latex.

61. Miller, 1,622,601. Mar. 29, 1927. A golf ball, comprising a core embodying rubber thread wound under tension, and a cover, the wound thread portion being permeated with latex to form a solid mass under tension.

62. Cutler, 1,622,860. Mar. 29, 1927. A shoe having an upper of leather, a rubber latex-treated strip of material secured thereto and extending above the welt line, and a sole of unvulcanized crepe rubber secured to the rubber latex-treated strip of material with a permanent union of the latex.

63. Bent, 1,623,522. Apr. 5, 1927. A photographic paper comprising a photographic layer and a paper support which are separated from each other by a coating of pigment, binder, and latex.

64. Biddle, 1,624,089. Apr. 12, 1927. An insect lime comprising one part of latex and two parts of a non-oxidizing oil.

65. Murray, 1,624,500. Apr. 12, 1927. A composite rubber sole comprising a layer of completely vulcanized rubber secured thereto.

66. Rost, 1,626,302. Apr. 26, 1927. A playing ball including tensioned windings of thin strips of unvulcanized coagulum rubber inherently cohered, the strips having substantially all cut surfaces.

67. Zimmerli, 1,626,493. Apr. 26, 1927. A surgical dressing adhesive consisting of a sterilized rubber latex emulsion stabilized by ammonia.

68. Smith, 1,627,255. May 3, 1927. A covered elastic thread comprising an elastic core, a fibrous inner covering enveloping the core of latex adhesive, bonding the core and fibrous inner covering together, and an outer fibrous covering enveloping both the core and the inner fibrous covering.

69. Dewey, 1,627,278. May 3, 1927. An adhesive composition comprising bentonite and latex, both extended in water, the bentonite predominating in quantity over the latex.

70. Prouty and Prouty, 1,628,910. May 17, 1927. A ceramic product is so prepared and fired that it will absorb latex.

71. Draullette, 1,629,487. May 24, 1927. Paving blocks are made from different granular material mixed with latex.

72. McGavack, 1,629,924. May 24, 1927. Rubber articles from latex by adding to latex, terpineol, disposing the mix in fluid form in a mold and permitting it to set, and drying. (*To be concluded*).

## Rubber's Role in Aviation

(*Continued from page 64*)

tion, is permitting more effective transaction of important business affairs. A sales manager of a prominent tire company recently reported that he had secured a $50,000 tire order through the help of an airplane. He dispatched a sample tire to the Pacific Coast via air express, while his competitors employed the conventional and slower train express. The speed of his response to the query materially aided him in winning the order.

Several rubber products companies are finding air mail valuable for communication between the factory and branch offices, for direct mail advertising, for important business correspondence, and various other matters.

## Power and Stretch of Belting

(*Continued from page 63*)

load slipped less than 1 per cent, but its tension ratio did not go higher than 11.

In regard to this type of belting the authors say, "It cannot be run so slack as the mineral-tanned belt. At a certain minimum tension ratio it loses hold suddenly and is apt to slip off."

Results shown by rubberized V-belting are also inferior to mineral-tanned belt. It is probably believed by many belt users that the wedging action of a rubberized V-belt gives it greater pulling capacity than is possible with any flat belt, but that is not true. The mineral-tanned belt pulled 60 per cent more per square inch of section than did the V-belt within the slip limit of 2 per cent.

## The Manufacture of Machine Dipped Goods

(*Continued from page 62*)

viscosity should change only slightly with rising or falling temperatures. The cement tank itself is lifted by cylinders under the machines, and should be freely accessible for adjustment of the oil pipes, valves, and hydraulic cylinders. The machines usually are located on the second floor of the building; the pump and accumulator on the first floor.

The consumption of power is very small. For example, a single machine uses at most ⅓ h.p. The amount of space for one machine is about 3½ feet wide by 7 feet long. The machines can be placed side by side close together as shown in the picture. Due to the slow and even movement of the hydraulically operated tanks and the mechanical rotation of the shaft carrying the forms, it is possible to use a far heavier cement than is generally used in open machines. This means a considerable saving in labor and in the amount of solvents used. The operator is in the position to obtain a required weight of the goods more quickly, and can dip more goods with a single unit in a given time. Since the forms are rotated mechanically, the rubber is distributed evenly, insuring goods of standard weight and appearance.

# Manufacture of Tire Treads

*Concluding the article that was published in* INDIA RUBBER WORLD, *January* 1, 1930.

IN THE manufacture of pneumatic tires it was at first customary to build up a fabric carcass upon a core and then apply the tread and side portions in proper order. The various plies necessary to form the casing are applied by the operator. The proper positioning of the strips is determined fully by the hand guided only by the eye as the core is rotated.

According to U. S. Patent No. 1,220,178, March 27, 1917, to Brucker, strips are assembled one upon the other previously to the application to the carcass and preferably as they issue from the calender, forming a slab, with the several rubber parts united so that the slab may be applied to the tire carcass. A common practice is to form the tread slabs by a tubing machine, cutting them to somewhat greater length than required, storing them with their ends anchored by folding around the ends of the storage book to permit the slabs to cool and shrink. After cooling they are cut to required length and assembled with the breaker and filler strips. Such assembly is slow and results in considerable waste.

A recent U. S. Patent No. 1,653,356, December 20, 1927, to Freeman, Haren, and Hartung, describes a machine in which relatively short lengths of the several materials may first be joined to form continuous strips which are progressively fed into contact with each other forming a continuous strip which may be severed into individual treads.

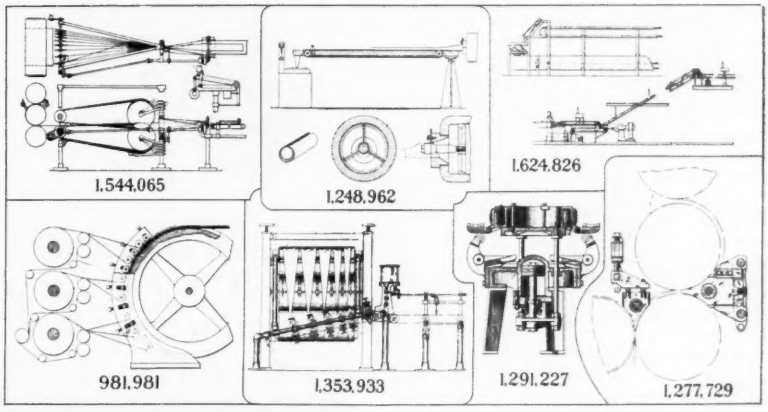
The following abstracts give a survey of the U. S. patents for making tire treads. It is interesting to note that nearly all the patents have been granted during the last ten years.

1. Crook, 981,981, Jan. 17, 1911. This comprises a drum having a stepped groove in its face, a segmental housing adjacent to the drum, guide rolls mounted in the housing, pressure rolls adjacent to the guide rolls, stock rolls mounted adjacent to the housing and each adapted to carry a series of strips, and feed rolls between the stock rolls, and a housing for directing the strips thereto. See group illustration.

2. Olier, 1,003,496, Sept. 19, 1911. This is for a calender for treads having two side frames, rollers located between the frames, rolling sleeves mounted on some of the rollers, an auxiliary frame supporting one end of the sleeve carrying rollers and removably mounted in one of the side frames, and means carried by the auxiliary frame for adjusting the rollers vertically.

3. Gammeter, 1,089,467, Mar. 10, 1914. This covers a machine for forming laminated tread slabs, consisting of means for feeding a sheet of material, a pair of knives for cutting a strip from the sheet, a drum for receiving the strip, and means controlled by the rotation of the drum for relatively displacing the knives laterally at the end of successive rotations of the drum for varying the width of the successive plies.

4. Swartz, 1,133,892, Mar. 30, 1915. This includes a tubing die having a cylindrical bore with a funnel-shaped inner end into which plastic material may be forced, a core projecting eccentrically through the bore whereby to form an annular discharge opening, gradually increasing in width from one side to the other, and a cutter projecting across the narrow side of the discharge opening whereby to slit the material forced therethrough.




5. Hennig, 1,170,154, Feb. 1, 1916. The method consists in punching openings in a rubber tread strip and inserting rubber inlays of a composition different from the tread strip, with the outer faces flush with the tread surface.

6. Gordon, 1,206,530, Nov. 28, 1916. This comprises a machine for forming strips of material for treads from rolls of stock material comprising strips of rubber and wrapper, means for stripping the wrapper from the rubber, bearing rolls beneath which the strips pass, guide plates in rear of the bearing rolls, a moving bearing surface upon which the strips are laid, means for driving the bearing surface, and a variable speed mechanism between the moving bearing surface and the stripper mechanism.

7. Brucker, 1,220,178, Mar. 27, 1917. The method consists in assembling in slab form the plurality of rubber strips comprising the rubber covering of the tire carcass, and applying the slab to the carcass by the progressive rolling action of spherical rollers moving in a path which is a compound of a circumferential and radial movement.

8. Webber, 1,248,962, Dec. 4, 1917. A tubing apparatus for tire shoes comprises a tube-forming die, means to vary its effective opening whereby the cross-section of the tube may be varied as desired, a conveyer to receive the tube from the die, and means operable when the tube reaches a predetermined point on the conveyer to indicate whether the tube is over, under, or of correct size. See group illustration.

9. Arens, 1,274,496, Aug. 6, 1918. A longitudinal rib is made centrally of the tread; a breaker strip composed of two parallel strips of fabric is applied to the tread at the sides of and adjacent to the rib.

10. Kearns, 1,277,729, Sept. 3, 1918. This machine provides a presser mechanism which acts on the stock while passing from one pair of calender rolls to another, creating a light bank which liberates imprisoned air, equalizing thickness and increasing density of the stock, and minimizing a tendency toward development of surface flaws. See group illustration.

11. Darrow, 1,282,767, Oct. 29, 1918. Tread and sidewall stocks are prepared by: first, imposing the sidewall strips in parallelism upon the face of the tread strip; second, cutting by shearing strokes the tread and each sidewall strip interiorly of the outer edges of the tread and strip; third, folding the sidewall strips back from their initial position on the tread strip until they form lateral continuations of the tread strip; and, fourth, applying pressure to the contacting edge portions of the tread strip and sidewall strips.

12. Hanna, 1,289,744, Dec. 31, 1918. The apparatus comprises a series of pressure rolls stacked one above another and arranged so that alternate rolls revolve at different speeds, wherein banks of rubber stock are placed into the bight of each set of contiguous rolls and rolled out into relatively thin sheets. Guiding devices bring all the sheets so formed one above another to form a single multi-ply sheet of the desired thickness.

13. Steele, 1,291,227, Jan. 14, 1919. A press for vulcanizing tire treads consists of a circular form upon which the unvulcanized tread is placed, a series of plates in the arcs of a circle pivotally mounted adjacent the form, means to rock the plates on their pivots to form a complete circle around the tread and to press the plates together to exert curing pressure thereon. See group illustration.

14. Little, 1,297,482, Mar. 18, 1919. An apparatus for making treads has an outletted container for the material to be operated upon, a laminating and separating means arranged at the outlet of the container, and means exterior of the container for squeezing the laminations together.

15. Brucker, 1,320,121, Oct. 28, 1919. A layer of tire fabric carries chafing strips, side and cushion strips, breaker and filler strips, and an outer tread.

16. Hobson, 1,327,912, Jan. 13, 1920. A tire tread is provided with substantially non-resilient insets in the body, so inserted and retained as to permit a comparatively free movement of the insets in the body, and so anchored as not to become removed or detached from the body, or their position therein normally changed either by the deformation of the tread by the roadway or by lateral motion of play imparted thereto by the travel thereof.

17. Valentine, 1,333,047, Mar. 9, 1920.

A die for making tire treads has a head formed with a cylindrical bore, an end wall for the head provided with a plurality of die openings, a mandrel located in the head, but spaced apart from the inner wall thereof to provide a passageway leading to the die openings, and means for securing the mandrel in non-adjustable fixed relation to the openings.

18. Midgley, 1,335,124, Mar. 30, 1920. Entrapped air was removed from tire treads by forming the tread in an endless band, perforating it with a plurality of small holes, and compacting the material of the tread to close the holes; the perforating and compacting operations are carried out while the tread is subjected to a partial vacuum.

19. Shea, 1,343,377, June 15, 1920. Making tire treads from hot rubber adapted to shrink upon cooling comprises passing the rubber stock through heated calender rolls to shape the tread and subsequently cooling the tread rapidly whereby a large proportion of the shrinkage is eliminated.

20. Morris, 1,353,933, Sept. 28, 1920. This consists of heated calender rolls, means for cutting the rubber sheet into strips of different widths, a traveling conveyer onto which the strips are delivered, a series of pressure rolls between which the conveyer travels, means for positioning and feeding the rubber strips onto the traveling conveyer, and means for delivering the strips produced by the calender to the positioning and the feeding means and for preventing the stretch of the rubber strips during delivery. See group illustration.

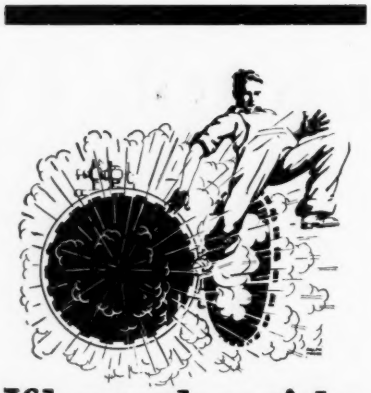
21. Morris, 1,353,934, Sept. 28, 1920. This comprises a plurality of calenders, each having a yielding pressure roll, means for cutting a sheet of rubber into strips of predetermined widths, means for superimposing one strip upon another upon the conveyer belt and for rolling each strip into contact with the preceding strips as they pass between calender roll and pressure roll.

22. Steele, 1,363,441, Dec. 28, 1920. The patent describes a calender including a cutting device for separating the calendered material into strips. The mechanism for building up each strip upon itself consists of an endless belt passing around a roll of the calender, means adjacent the roll for pressing the strips together, means for holding the strips against the lower stretch of the belt, devices for cooling the strips, and means operable by the upper stretch of the belt for reeling up the built up strips.

23. Brownell, 1,364,241, Jan. 4, 1921. A mold for tire treads has an annular mold member provided with a peripheral tread-forming cavity of a split clamping band encircling the mold member, and adapted to fit into the mouth of the cavity, and means for locking the ends of the band together.

24. Maranville, 1,365,115, Jan. 11, 1921. A tread curing press consists of a supporting shaft, a drum mounted on the shaft, a plurality of radially movable slides arranged about the drum, arc shaped compressors secured to the slides, the compressors when in their innermost position describing a circle, and a system of levers to move the compressors.

25. McGuire, 1,382,207, June 21, 1921. This includes an apparatus for the preparation of treads, comprising a machine for forming the treads in a continuous strip, a cooling device, and a knife for cutting treads from the strip; and means for conducting the tread strip through the apparatus.



**If heater door sticks NEVER pry it open until you are SURE all the steam is out**

26. Knaus, 1,422,209, July 11, 1922. An apparatus for vulcanizing treads consists of a plurality of superposed mold units arranged in pairs, the two molds comprising each pair being formed with inclined meeting surfaces for centering the molds with respect to each other, and for communicating pressure to the parts in a direction radially thereof, when vertical pressure is applied to the molds.

27. Roberts, 1,433,971, Oct. 31, 1922. Entrapped air is removed from a moving laminated sheet by inserting a hollow needle through a plurality of layers while they are moving, and by sucking the air from between each two contiguous sheets as the needle is inserted and withdrawn.

28. Beauregard, 1,469,875, Oct. 9, 1923. A method of preparing two-ply rubber stock having stepped-off edges consists in forming a rubber strip, rolling up the strip on a liner, forming between two rolls of a calender a second strip wider than the first, leading the first strip with its liner over a third roll of the calender, pressing the second strip against the first strip while supported by its liner and the third roll, and preserving the alinement of the two strips.

29. Shively, 1,482,325, Jan. 29, 1924. A tread band mold comprises annular male and female die members, one of which is formed of mating sections, the male member having an outer peripheral portion conforming in contour to the tread surface of a tire carcass, and the female member having its inner peripheral face provided with a matrix portion for forming the tread face of the band; and a presser head operable for assembling the sectional member and pressing the sections into peripheral contact with the other member.

30. Ames, 1,541,092, June 9, 1925. A tread unit assembling device is provided with a traveling belt for receiving a tread element, guides for positioning the element thereon, a stationary support positioned above and parallel to the belt for positioning a second tread element and from which the second element may be moved into assembled relation with the first element, a second belt, parallel to the first belt, adapted to position a third tread element and move the latter into assembled position with the previously assembled elements on the first belt.

31. Morris, 1,544,065, June 30, 1925. Making a tread consists in moving a sheet of rubber longitudinally, and simultaneously supporting in varying spaced relation longitudinal portions thereof to permit intermediate portions to form folds of different widths, converging the lines of support as the longitudinal movement progresses until folded in a plurality of folds of different widths, holding the several folding portions out of contact with other folds until the folding is completed, and then compressing the folded portions into a homogeneous body. See group illustration.

32. Fisher, 1,544,305, June 30, 1925. Continuously forming vulcanizable rubber composition into tread stock consists in forming the composition into a strip having a greater total area in cross-section and also a greater thickness at the center than the product sought, subsequently compressing the strip, and shaping it to the desired form.

33. Smith, 1,581,361, Apr. 20, 1926. This is a device for assembling tread units comprising stationary parallel guides adapted to position the longitudinal edges of a member of the tread unit and a guide bar hinged to the table and adapted to be swung into a position adjacent the face of the member and an intermediate and parallel relation to the stationary guides.

34. Bulley, 1,624,826, Apr. 12, 1927. The method consists in continuously extruding a rubber slab, passing it through a water bath and rapidly partially cooling it, thereafter more slowly cooling it while continuing the motion of the slab and permitting the stock to shrink, and then conveying the slab to a remote point and subjecting it to a progressive weighing action during such travel while maintaining the portion subjected to slow cooling free from tension. See group illustration.

35. Goodwin, 1,633,249, June 21, 1927. This is an attachment for calenders and provides an apparatus which will receive the calendered rubber in strips of varying widths and automatically laminate them into a composite strip adapted to be severed into suitable lengths and employed as treads.

36. Thompson, 1,649,933, Nov. 22, 1927. Endless tire bands are formed by splicing a strip of tread stock of the proper length, passing it over a feeding apron driven at a given linear speed and thence through soft surfaced compression rollers driven at a slightly greater peripheral speed, and adding separate layers of breaker and cushion stock, rolling and splicing each layer into place on the tread band.

37. Freeman, 1,653,356, Dec. 20, 1927. Making tread slab assemblies comprises providing a shrunk full-section tread slab strip having a plane face on one side and a raised medial zone on the other, and applying a fibrous layer adhesively to the strip by guiding the two into contact with each other while propelling them by engagement with their mutually adhering portions.

38. Weisse, 1,682,876, Sept. 4, 1928. The method of cooling tread stock comprises advancing it through a cooling liquid in freely suspended festoon formation with the advancing means engaging the stock only at the underside of the upwardly extending loops of the festoon.

39. Walter, 1,690,514, Nov. 6, 1928. Treads are produced by providing a length of lining material, a relatively thin layer of calendered rubber of the same width as the lining material, uniting the rubber and lining material under pressure, forming a narrower but thicker tread body of rubber, and uniting the tread body to the thin layer of calendered rubber.

# Editor's Book Table

## Book Reviews

**"Die Lage der Kautschukmarktes in der Nachkriegszeit."** By Dr. Heinz George. Published by Wilhelm Christians Verlag, Berlin S. W. 19. 1929. Stiff paper, 6 by 8 inches, 150 pages. Tables. **Bibliography.**

In the present book, Dr. George discusses the problems that have confronted the rubber industry since the end of the war. Starting from the beginning of the industry, he introduces the reader, in a preliminary chapter, to the various rubber bearing plants and the development of rubber cultivation up to the end of the war, indicating the various uses of rubber. Then follows the book proper divided into two parts, a conclusion, and an appendix. Part one describes the slump, its causes, and the various attempts to remedy it until the Stevenson Scheme was introduced.

In Part II the working of this scheme is handled—its effects on production, price, consumption; the American consumers and their counter measures; defects of the scheme. The final portion is devoted to a survey of the market condition since the abolition of restriction and a discussion of the future in which the conclusion is reached that possibly the solution of the rubber problem may yet be found in synthetic rubber. Several tables are appended including one in which the financial position of sixty rubber producing companies is analyzed. A list of the various publications consulted is also added.

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**"Proceedings of the Thirty-second Annual Meeting."** Part I. Committees' Reports, New and Revised Tentative Standards. Part II. Technical Papers. American Society for Testing Materials, 1315 Spruce St., Philadelphia, Pa. Cloth, 6 by 9 inches. Illustrated.

Part I contains 73 reports of committees and sub-committees on ferrous and non-ferrous metals, cement, lime, gypsum, concrete, and clay products; miscellaneous subjects including fabrics and rubber products: 47 tentative standards which are either revised or published for the first time; 41 tentative or standard methods of testing; list of officers and members of the Executive Committee; and subject and author indices.

Part II contains the Fourth Edgar Marburg Lecture on Cohesion and Atomic Structure, and 57 technical papers with discussions by experts in the field of materials engineering and testing. The volume has subject and author indices.

**"Machine Design as It Affects Engineering Production Sales."** Vol. 1, No. 4, December, 1929. The Johnson Publishing Co., Penton Building, Cleveland, O.

This monthly publication is devoted to a field of great interest and importance in this machine age. Besides a comprehensive list of helpful articles by practical engineers and designers, the book regularly features in established departments information concerning noteworthy patents, new materials and parts, book reviews, and current topics of interest to the design profession.

## Letters from Our Readers

### Advantages of Chrome Plate

To the Editor:

Dear Sir: The writer has noted with keen interest an article by L. M. Klinedinst in your February, 1930, issue, covering anti-friction bearings as applied to heavy duty tubers. You should know a few facts pertaining to the worm which goes into these tubing machines and the advantage of chrome plating.

Hard chrome plate, when applied to parts of rubber machinery, has two distinct effects, due to the smoothness of the plated surface: the reduction of friction and the production of smooth rubber goods.

In November, 1927, we hard chrome plated at our Akron division a 6" tuber worm, with a deposit of hard chrome equal to .00150". This deposit was applied directly on the worm section and not on the bearing extension.

In June, 1929, this machine was dismantled for the replacement of bearings; the company reported that this unit operated during the busy season on the basis of a 24-hour day, or not less than 1,200 hours.

After 2½ years of constant operation, the specimen as to chrome deposit was found to be perfect, and there were no signs of wear, which positively established the value of chrome for this purpose.

The National Sherardizing & Machine Co.,
A. F. Schoen, Pres.

Hartford, Conn.
Feb. 7, 1930.

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### Meeting of Committee D-13

Committee D-13 (A.S.T.M.) will hold its spring meeting at Charlotte, N. C., on March 13 and 14, 1930. The program will doubtless be somewhat crowded and will include a total of 10 proposed and tentative standards that must be considered and advanced to tentative and standard.

## New Publications

**"U. S. Heavy Service Tire Manual and Changeover Guide."** This well-indexed handbook, now in its second edition, was prepared and issued by the Technical Service Division, United States Rubber Co., Detroit, Mich. The book is replete with original data on selection, sale, servicing, and proper tire equipment for heavy motor transportation service.

It contains a special section devoted to the subject of changing over vehicles from solids to pneumatics and from high-pressure tires to balloons. In it are discussed changeover considerations and methods, supplemented by data for vehicle analysis and proper tire sizes.

**"Practical Pointers on the Selection of Motor Control."** This illustrated booklet of 32 pages, written by an electrical engineer, is issued by Cutler-Hammer, Inc., 149 Twelfth St., Milwaukee, Wis.

The booklet will be of special value to those whose problems call for information beyond the elementary knowledge of motors and motor control. It stresses in particular the features to consider when selecting motor control; tells how to choose control to suit the motor's load and how to select control for direct current motors and also alternating current motors.

**"The Next Five Years in American Business Profits. II—The Automobile Tire Industry."**

This 18-page pamphlet is a special supplement of "Trade and Securities Service" issued by Standard Statistics Co., 200 Varick St., New York, N. Y. It presents a masterly discussion and analysis of the tire industry, its trend, gravest problems, and their solutions, supplemented by a chapter on profits and security values. This comprehensive statistical study will prove enlightening to tire manufacturers, dealers, motorists, and the investing public.

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### Rubber Tires Compulsory

A bill, introduced by Senator Chas. W. Faulkner, of Pittsfield, making equipment of all motor vehicles with rubber tires mandatory, believed the first legislation of its kind ever proposed in this country, has been filed with the Massachusetts state legislature. The measure provides that the substance of the tire be approved by the department of public works and makes it mandatory that no metal part of the wheel or tire, except non-skid devices, touch the ground. Fines of $50 to $100 are provided for violations.

# EDITORIALS

## *Rising Tide of Native Rubber*

WITH the rapid rise in the output of native rubber steadily dimmer grows the price-fixation hope cherished by many British planting companies. For many years the irregular efforts of Dyaks, Malays, Javanese, Chinese, Battaks, Sumatrans, Tagals, and Papuans to duplicate the work of Europeans occasioned little anxiety. Then came Restriction. True, it brought better prices for a while but it also offered a powerful incentive to independent enterprise. The natives were shrewd enough to see the advantage, and from an almost negligible amount their outturn now reaches almost half that of all planted *Hevea* rubber.

Total production by natives may not soon outstrip that of Europeans, but they obtain between 700 and 800 pounds to the acre, while those who founded the industry garner scarcely 400 pounds. The natives are accused of planting too closely, of being wasteful in tapping, caring little about bark renewal or tree diseases, and of faulty preparation of rubber; but they have got a good running start, and the acreage they can secure is quite unlimited. True, experiments on European estates with seed selection and budgrafting indicate that output may yet be raised to 800 or even 1,200 pounds per acre, and a way may be found to bring production cost lower, but the latter will have to be very low to compete with cheap native family labor and low overhead.

Still the estates are not without recourse. Being well organized, they can carry on a publicity campaign that should benefit them as much as the educational work of American fruit growers, for instance, profited the latter. Rubber buyers are open-minded and will consider quality advantage as well as price; and if they can be persuaded of the economic superiority of estate rubber generally over most of the "maverick" small-holder sort, plantation interests need worry little about being engulfed by the rising tide of native rubber.

* * *

## *What Price Pure Science?*

THE overpractical rubber shopman finds it hard to understand who so much stress is put on the importance of research work in pure science when the outcome is uncertain and often direct benefits are not even sought. It is very interesting, he says, to hear that the rubber molecule has a crypto-crystalline, reticulated, two-phase structure; that isoprene and its analogs are being polymerized in new ways; that sub-atomic delving hints how carbon and hydrogen combine; and to read views on the nature of vulcanization, acceleration, anti-aging, the interaction of compounding ingredients and all the phenomena incident to rubber processing; but he still believes that most of the time and money spent in "vague quest" might be better used in solving pressing, every-day problems of production.

Such a view, of course, is short-sighted. Competition is keen; goods have to be made quicker, cheaper, and better than ever before; but there is something beyond immediate requirements. Manufacturers of rubber and other goods who would reap future as well as present advantage must have vision. This was early realized by the German dye trust. For years it kept scores of chemists carrying on tedious experiments and exhaustive research. Yet if one evolved but one discovery of practical value in a year, his employers felt amply rewarded. The resulting virtual domination of the world's dye and chemical trade by the trust up to the World War is familiar history. Even now industrial research in Europe is much ahead of that in America.

But pure science is being increasingly studied and put to work here, and none are showing greater appreciation of its potential usefulness than leaders in the American rubber industry. When the latter's remarkable progress in the past quarter-century is analyzed, a great part must be credited to both the patient researchers and those who substantially showed faith in the latters' endeavors. In the light of what has been accomplished the chances are, with the experience gained and ampler facilities, researchers will in the near future much excel previous achievements, and may even solve some of the most basic and baffling problems of the industry.

* * *

"NOW WOULD APPEAR THE TIME FOR BRITISH (RUBBER) firms to emulate their American competitors here by opening subsidiaries to vie with them in their home market—and, incidentally, further the interests of the Empire," advises a writer in an English contemporary. But British firms are cautioned not to attempt tire making, "in which competition is too deadly keen for profit, but rather to specialize in sundries for which there would be a regular though relatively smaller market." An American could scarcely give a compatriot sounder counsel in making a rubber goods venture.

* * *

SUMMER AND WINTER TIRES! PERHAPS THAT IS the answer to the observation of the United States Bureau of Standards that, inasmuch as temperature has a great influence in determining tire wear, a tire which wears best in winter is not the best tire for summer wear. The vogue for two types of automobiles per single owner being increasingly popular, why not also encourage car-owners to have two seasonal sets of tires, and thus spur on the general (and particular) national prosperity program for 1930?

# What the Rubber Chemists Are Doing

## The Effect of Damp Storage on Raw Rubber[1]

B. J. Eaton and R. G. Fullerton

IN this paper the authors report their study on (1) the relationship between mold development and moisture absorption by rubber when kept in damp storage, (2) the effect of mold development on loss of weight of the raw rubber, and (3) the effect of mold development on the nitrogen content of the rubber. Eventually the investigations are to be extended to a study of the effects of molds on the intrinsic qualities of raw rubber in respect of vulcanization properties, a matter which has previously been investigated to some extent by Eaton[2] and by de Vries.[3]


### Summary

The results of the investigations described may be summarized as follows:

1. Smoked sheet and air-dried sheet rubber, when allowed to absorb moisture, almost invariably develop molds from spores which enter the latex after it exudes from the tree, or which enter the coagulum at some stage during preparation.

2. The absorption of moisture by raw rubber, when stored in an atmosphere of high humidity, reaches a maximum after a few days.

3. In samples in which molds develop, a loss of weight occurs and continues to increase for a long period. The maximum loss shown has amounted to about 17 per cent during a period of about 15 months' damp storage.

4. The loss of weight due to the action of molds shows that the hydrocarbon-caoutchouc is attacked, since first-grade raw rubber does not contain more than 5 to 6 per cent of non-caoutchouc constituents. The losses are in a gaseous form, since none of the samples examined have been rewashed or treated with any solvent.

5. In the case of sheet rubber, which is well smoked, molds develop only after a long period.

6. The addition to latex of para-nitrophenol or the subsequent treatment of the freshly machined sheet with a dilute solution of this chemical, considerably retards, but does not inhibit, the growth of molds, under the conditions described.

7. Trichlor-sodium phenate is not in practice so efficient as para-nitrophenol in inhibiting mold growth. This is due to the effect of the dilute acid used as a coagulant which converts this compound into the highly volatile trichlor-phenol.

8. The development of chromogenic organisms in crepe rubber in damp storage also causes a loss of weight, although the loss is smaller than in the case of sheet rubber.

9. The growth of molds causes no loss in the nitrogen content of the rubber, although the nitrogenous constituents may be changed in character by the molds.

10. The development of a defect in smoked sheet known as "white or virgin" streak is shown to be due to the effect of allowing the rubber to become damp and not due to the rubber being insufficiently dried during the smoking process. Dry unsmoked sheet allowed to become damp becomes white and opaque throughout.

11. In the smoke drying of rubber, as carried out during recent years, the wood fuel is too completely combusted, producing a smoke which contains little creosote or other antiseptic constituents. This applies to the effect of the smoking process only on mold development and not to its effect on any intrinsic properties of the rubber.

12. Further investigations on the smoking process and also on rubber treated in different ways with para-nitrophenol or other fungicides are required before definite recommendations for procedure can be offered.

13. This investigation confirms and extends previous investigations carried out by one of us, B. J. Eaton, and other workers.

In the continuation of these experiments to date a loss of weight of about 28 per cent during a storage period of 620 days has occurred in the case of sheet rubber.


[1] *Bulletin No.* 2, Oct., 1929, 26 pp., Rubber Research Institute of Malaya, Kuala Lumpur, F. M. S.

[2] Eaton, Day, and Grantham, *Bull. No.* 27. "The Preparation and Vulcanization of Plantation Para Rubber," 1918, pp. 163-69.

[3] De Vries, "Estate Rubber," 1929, p. 360. *Arch. Rubbercultuur*, Vol. XI, No. 7, 1927, p. 279.

## The Aging of Vulcanized Rubber Under Varying Elongation[1]

A. A. Somerville, J. M. Ball, and W. H. Cope[2]

IN this paper the authors report a very extensive and rather unique study of a most important practical rubber problem. The method, factors studied, and results are given in the following excerpts from the paper.

### Experimental Method

Circular test rings were cut from flat sheets of cured rubber, then stretched and held at different elongations on a stepped steel cone. The sizes of the steps on this cone are such that the test rings are stretched from 0 to 100 per cent. Straight mandrels of varying size were also used in addition to this stepped cone. Aging of the rings on the stepped cone or on the mandrels was then done under four conditions: (1) in the Geer oven where the principal factor concerned is heat; (2) in the Bierer-Davis bomb where the chief factor is oxygen; (3) in an electric spark chamber where the principal factor is ozone; and (4) in the great outdoors where the chief factor is sunlight.

It should be definitely understood that this experimental work concerns itself only with static aging, not with dynamic aging where the test strip is being twisted, flexed, bent, or stretched repeatedly during the aging process. That problem of dynamic aging is entirely different from the present problem of static aging at different elongations, particularly when waxy materials are used in the compound to form a protective film.

A total of sixty-six compounds or recipes was used. These compounds were first cured in sheet form in molds, a range of cures was made at one temperature, tensiles were determined on dumbbell test strips, and what was deemed to be the proper cure or cures was determined from the tensile-time curve. This curve simply represents tensile strength plotted against time of cure. From it the point or points which are considered the proper cures are chosen.

### Factors Studied

The variation in the rate and degree of deterioration with respect to varying elongation was then studied as affected by the following factors: (1) fillers, (2) volume loadings, (3) accelerators, (4) percentages of accelerators, (5) percentages of sulphur, (6) antioxidants, (7) percentages of antioxidants, (8) softeners and waxes, (9) vulcanizing agents, (10) percentages of vulcanizing agents, (11) rubbers, including synthetic, (12) times of cure, (13) periods of bomb aging.

In addition to the above, aging tests were made on rubber bands at different elongations from 0 to 700 per cent. These bands were pure gum with 5 or 6 per cent sulphur plus antioxidant.

### Summary of Results

1. Deterioration in the oven is approximately 30 per cent greater at 100 per cent elongation than at 0 per cent elongation

[1] Presented before the meeting of the Division of Rubber Chemistry, A. C. S., Atlantic City, N. J., September 26, 1929.

[2] R. T. Vanderbilt Co., 230 Park Ave., New York, N. Y.

2. Deterioration in the bomb is almost independent of elongation.

3. Deterioration in ozone is greatest at 5 and 10 per cent elongations.

4. Deterioration in sunlight with respect to stretch is analogous to deterioration in ozone.

5. Cracking of the test rings occurs in both ozone and sunlight when the rings are stretched, but not in the oven or bomb. This cracking is greatest at 5 and 10 per cent elongations.

6. A 40 per cent carbon-black stock shows marked deterioration and cracking in both ozone and sunlight at about 10 per cent elongation.

7. High sulphur causes greater deterioration in ozone and sunlight than low sulphur.

8. Undercures show greater deterioration than the optimum cure in ozone and sunlight.

9. Loading with a filler such as whiting does not change the shape of the ozone- and sunlight-aging curves, and does not materially affect the percentage deterioration.

10. Rubber bands show progressively poorer aging in the bomb as the stretch increases from 0 to 700 per cent, while in ozone they give an aging curve having the characteristic dip at about 10 per cent elongation, showing the least deterioration at about 400 per cent elongation.

11. Tetramethylthiuram disulphide (3 per cent) as a vulcanizing agent causes rather low percentages of deterioration in ozone and sunlight, and gives fairly flat aging curves.

12. Mineral rubber (24 per cent) causes a smaller percentage deterioration than 4 per cent except at the critical elongation of about 10 per cent.

13. Paraffin (1 per cent) causes pretty bad deterioration in ozone, but provides some protection in sunlight.

14. Added antioxidant does not change the shape of the ozone- or sunlight-aging curves, but may lessen the amount of deterioration.

15. Two antioxidants may give comparable results in both oven and bomb, but quite different results in ozone and sunlight.

16. Synthetic rubber gives a characteristic ozone-aging curve.

### Laurex

Laurex, the zinc salt of lauric acid, is a light gray soft granular powder with zinc content of about 17 per cent and specific gravity about 1.10. Its function in rubber compounding is the same as stearic acid, namely, to stabilize the curing quality of the rubber. Because of its solubility in rubber, Laurex is entirely free from the tendency to bloom which characterizes stearic acid, and for the same reason it is an excellent activator for organic accelerators. When used in place of stearic acid, less zinc oxide is required as accelerator, and in the case of transparent goods the zinc oxide addition can be entirely omitted. The effect of Laurex on the tensile properties of vulcanized rubber is notably favorable actually and relatively.

## Permeability of Rubber to Air

### I—Effect of Temperature, Pressure, and Humidity[1]

V. N. Morris and J. N. Street[2]

The authors note that the permeability of rubber to gases is of much more general interest, since it is a factor of prime importance in connection with many of our modern products, such as automobile inner tubes, dirigibles, gas masks, tennis balls, other balls for athletic contests, etc.

The experimental results obtained by employing special apparatus and procedure are summarized by the authors as follows:

The relation between total pressure and permeability has been found to be almost linear, the permeability being approximately proportional to pressure. The temperature coefficient of permeability is very high, thus indicating that the pressures of inner tubes should be checked much more frequently in summer than in winter. Moisture has been found to decrease the permeability of rubber to air slightly under certain circumstances. Prolonged immersion of the rubber in water, however, resulted in an appreciable increase in permeability.

[1]Presented before the meeting of the Division of Rubber Chemistry, A. C. S., Atlantic City, N. J., September 26 to 28, 1929.

[2]Firestone Tire & Rubber Co., Akron, O.

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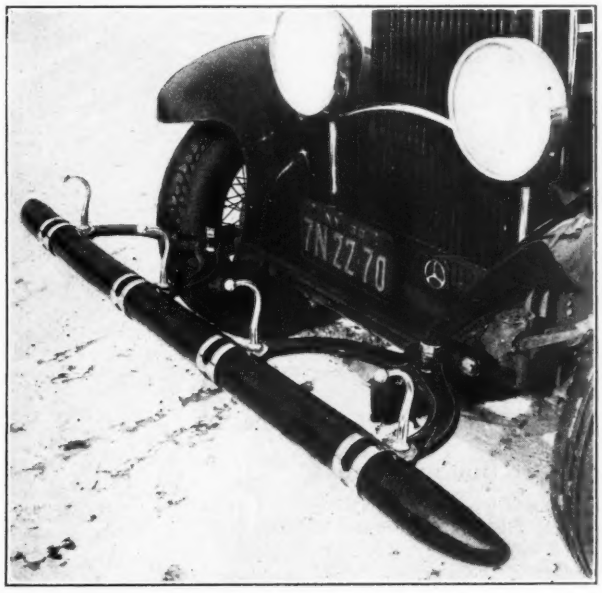
## RUBBER CRASH ABSORBER

IT IS estimated that an automobile weighing 3,000 pounds striking an obstacle at 15 miles per hour will deliver a blow of 5,000 tons, and this force increases in algebraic progression with the advancing speed of the machine. A revolutionary principle for absorbing this dynamic energy has been embodied in a shock absorber in which rubber is a special feature. The illustration pictures this bumper attached to the front end of an automobile. This device is the invention of Capt. Franzcarl Schleiff, a former ace of the German air force.




**Schleiff Rubber Bumper**

In general appearance it resembles the usual metal automobile bumper and consists of a 3-inch solid bar of rubber attached horizontally to the chassis by two pairs of partly opened tongs with swivels where they join the chassis and their ends clamp to the rubber. Collision, causing wider opening of the tongs stretches the elastic rubber, its lateral extension and recoil spending the impact progressively to left and right before it reaches the chassis. Captain Schleiff successfully demonstrated the efficiency of this device in New York on February 18, when three crashing tests were made. The most impressive was when Captain Schleiff drove the test car at 18.25 miles per hour into a concrete pillar. He was thrown through the door of the car to the pavement, but was unhurt; while the steering wheel and one head lamp of the car were badly damaged.

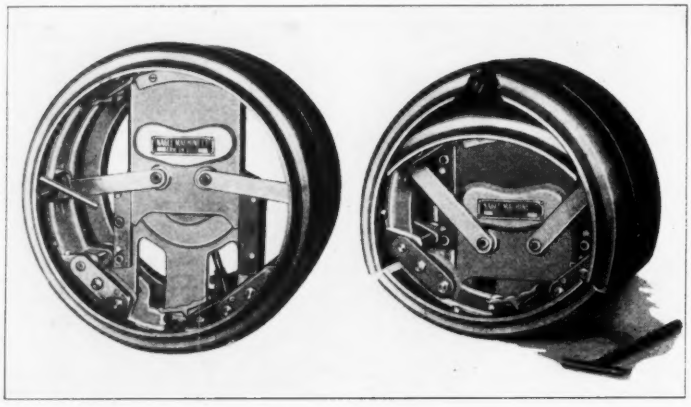
## Tire Cover in Colors

THE familiar fabric tire cover which contributes protection to the spare tire of an automobile but nothing to the artistic color scheme of the car now can be replaced by a steel tire cover that is as beautiful as it is enduring besides being rustproof and rattleproof.

This device has neither hooks nor clamps. It consists of only two parts: first, the cover that fits the sidewall of the inflated tire and is provided with an anti-rattle rubber cord rolled into the edge of its inner circumference; second, the spring steel hollow retaining band that springs around the tread of the tire and the outer circumference of the cover piece, resting against the anti-rattle rubber cord above mentioned.

Both parts may be "ducoed" in any colors desired to match the color of the car, or the retaining band may be chromium plated. Lyon Cover Co., Inc., Detroit, Mich.

# New Machines and Appliances



FULL CIRCLE AND FOLDED

**The Powerfold Tire Building Drum**

## Flat-Band Tire Building Drum

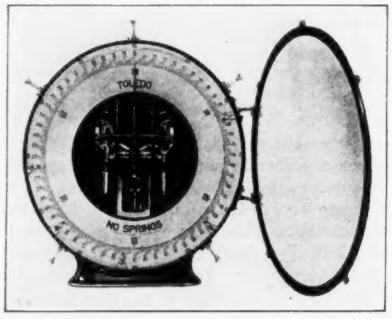
AN improved power-operated collapsible tire building drum here illustrated is pictured in full circular and folded positions. The drum is collapsed or folded by the motive power acting through a new combination of cam groove and crank action, which produces a reduction of 25 per cent in the periphery of the drum to facilitate removal of the tire band.

To operate the drum it is merely held stationary by both hand grips, one on each side, at the same time. One half revolution of the main drive shaft in either direction causes the drum to fold. The action of folding and expanding to full circle is accomplished automatically by stopping and starting the drum. Owing to the crank action neither operation produces any shock.

The flanges of the drum are mechanically adjusted for width by double acting screws operated by a pinion wrench. The shells are of cold drawn steel machined to contour after assembly. The drum is held round by means of drill rod register pins placed in each section, drawn together with case hardened register plates on each side of the wedge section. The latter is mounted on a steel slide working in double-angle case hardened steel gibs operated by a crank pin with hardened and ground tool steel cam roller. Each hinge section is mechanically operated with a slide by a link and is pivoted on drill rod pins which turn in hardened and ground steel bushings. The Nagle Machine Co., Erie, Pa.

## Compounding Dial Scale

WHERE compounding is a feature of the mixing process as in rubber goods manufacturing, the dial scale here pictured is of special interest and value. It is of the familiar "no spring" type supplied with dials 20 or 28 inches in diameter for convenient and rapid reading.




**Toledo Dial Scale**

The dials are fitted with six serially numbered metal pointers which can be moved at will on a metal band located at the extreme outer edge of the chart. Each pointer is on the same plane from the face of the dial as the indicating hand so that it stands point to point with the indicating hand in each case, thus eliminating the chance of misreading.

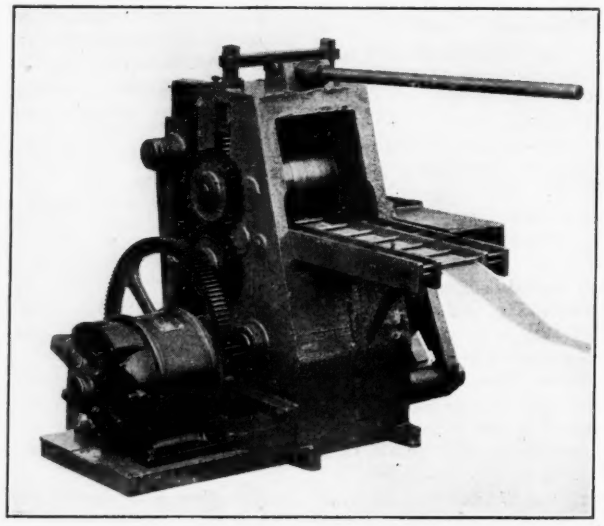
The scale thus equipped becomes a predetermined weight scale quickly adjustable to any formula and yet at all times immediately available for the usual purposes of weighing.

If desired, the scale can be furnished with a blank chart, test weights being used to set the pointers, so that a secret formula will be safeguarded. Unskilled labor can thus be used because the operator does not need to remember or even know the poundage of the various ingredients weighed. This eliminates calculation on his part and reduces liability of error. Toledo Scale Co., Toledo, O.

## Roller Feed Stock Cutter

THE accompanying illustration pictures a roller feed machine designed for cutting inner tube patching gum, fabric strips, light brake linings, and all kinds of flat stock, also round or other sections of extruded forms in rubber such as baby cab tires, tubing, windshield rubber, and other automobile rubber strips. Its characteristic features include automatic measuring and cutting, elimination of waste, exceptionally large output, quick adjustment, simplicity of operation, and saving of labor.

The standard machine cuts up to 6 inches in width and is adjustable for any length of cut from ¼-inch to 32 inches. Adjustment for length of cut is made in less than a minute; therefore the machine can be used for general purpose work, and all



**Utility Stock Cutter—Rear View**

Bristol Roll Surface Thermocouple and Indicating Pyrometer

sorts of material may be cut such as uncured tubed or calendered rubber, vulcanized rubber, or fabric and woven materials. The same design of machine is made for 12- and 18-inch cutting widths, and it can be made to cut 32-inch lengths.

The machine makes a shearing cut which is suitable for most materials. However, when necessary, it can be arranged for a knife cut. The machine works best when driven by a variable speed device of some kind, either mechanical or a direct current motor with variable speed control. Where the product admits of it, several strands of material may be fed side by side, giving a very large production of cut pieces. The output is often facilitated by fitting a conveyer to the machine for supplying the material to be cut and removing the output. Utility Mfg. Co., Cudahy, Wis.

## Instrument for Reading Roll Temperature

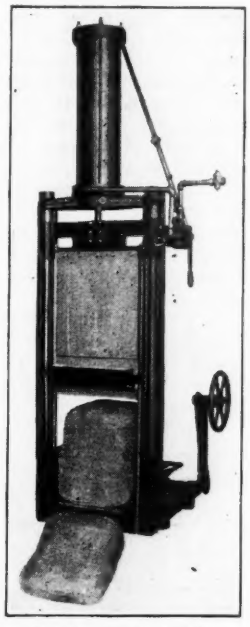
CLOSE regulation of roll temperature is necessary for mixing and calendering high tensile and reenforced stocks in order to obviate the danger of scorching or partly vulcanizing them while in process. Special electrically operated and recording heat measuring instruments, both portable and fixed, are available for this purpose. The one pictured here is of the portable variety, and by means of the long handle with which it is provided, the user can apply it to test a roll that can not otherwise be reached conveniently. Thus its portability is a feature of economy.

The device itself consists of a roll surface temperature couple in combination with a standard portable indicating pyrometer. The latter, contained in a handy case, has a high resistance milli-voltmeter type of movement with double jeweled bearings. It is also equipped with Bristol's automatic internal cold end compensator and zero adjuster. The scale is furnished with a mirror to avoid errors due to parallax, and the pointer is of the knife-blade type.

An electrical damping device automatically operates when the cover of the instrument is closed. This prevents the pointer from excessive vibration and the moving coil from injury when being carried about. The Bristol Co., Waterbury, Conn.

## Crude Rubber Cutter

A THOROUGHLY compact and efficient machine for slicing baled rubber is pictured in the illustration. It comprises a pair of vertical housings mounted on the base and connected at the top with a cross member which supports a vertical air cylinder and piston. The latter is actuated by air pressure piped from a compressor. The cutting knife is full width of the space between guides, and its up and down strokes are controlled by a two-way air valve, which admits air pressure to the piston by a sudden trigger-like action. Pressure of 100 pounds per square inch is required to slice through a bale of the highest grade of crude rubber.



Black Rock Rubber Cutting Machine

A soapstoning device, attached across the uprights of the machine, consists of a pair of brushes set on each side of the blade, with a trough over the front brush. As the blade completes its upward stroke, enough soapstone passes under the blade to supply sufficient dust to the back brush. When cutting gutta percha or balata, no soapstone is required.

In operation the bale of rubber is placed under the knife as shown in the picture, and may be reduced to slices two inches thick at the rate of from 15 to 20 seconds a cut. The operator advances the bale for each cut by operating the hand-wheel with one hand; while with the other he works the valve which actuates the power piston.

As a suggestion for an installation a roller conveyer system might be used to bring the rubber to the machine with the top of the conveyer rollers at the same level as the top of the table or base of the cutting machine. Thus the operator could easily slide a bale from the conveyer into the machine. Black Rock Mfg. Co., Bridgeport, Conn.

## Water Extractor for Reclaiming Rubber

RUBBER reclaiming as now conducted is more nearly a continuous process than can be found in any other branch of the rubber industry. This is due to the extensive employment of conveyer systems both mechanical and pneumatic for the onward movement of stock from the piles of scrap rubber through the various mills and apparatus for grinding, digesting, washing, cleaning, drying, and refining.

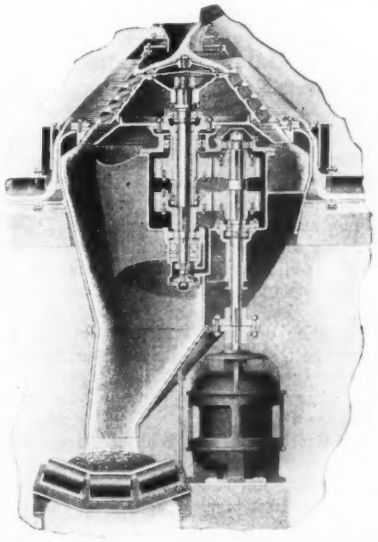
One of the intermediate pieces of apparatus that delivers washed stock ready for final drying is the continuous centrifugal here pictured in vertical section, showing the attached motor drive and the arrangement for the continuous delivery of the denatured stock onto a belt conveyer.

In operation the material enters the machine at the top, falls on the cone, when the centrifugal force throws it against the screen. It slides down the screen until it meets the upper end of the hindrance flights, and while so doing, the liquids instantly begin to pass through the perforations in the screen.

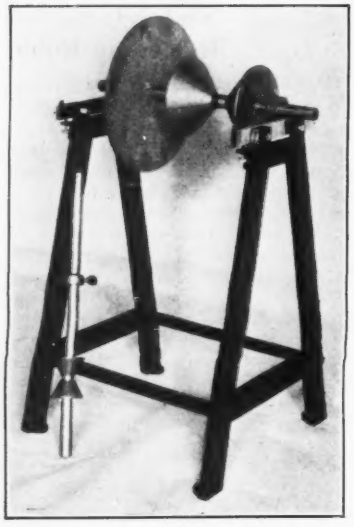
The flights spiral downward, and as the screen moves slowly around them in the direction of their downward pitch, while both are traveling at a speed of nearly two miles a minute, the solid portion gradually finds its way to the bottom of the screen cone, all the time entering zones of increasing centrifugal force, tending to remove all liquids from the solids not held there by surface tension.

The solids leave the rotating screen, strike tangentially the outer casing and fall to the conveyer belt or other means of disposal. The liquids, after passing through the screen, fall into the launder that surrounds the top of the main outer casing and flow to two openings fitted for pipe flanges, thence to such disposal as the case may require.

It should be noted that there are but few pounds of material in this machine at any instant, permitting an easy escape of the fluids through the screen. As the



Elmore Continuous Centrifugal



**Feragen Balancing Stand**

material slides down the screen, it enters larger areas, spreads itself in thinner rolls on top the spiral flights and constantly becomes under the influence of greater centrifugal force; all tending to the more perfect and instant extraction of the fluids.

The machine is adaptable for use in a wide range of process industries among which is rubber reclaiming. Elmore Centrifugal Products Corp., 6527 Manchester Ave., St. Louis, Mo.

## Quick Changing Strainer Head

THE outstanding feature of the new Royle straining machine head is the ease with which the straining screens may be removed and replaced by means of the hinged type expansion head. These machines are used in leading rubber factories, and show high production figures. John Royle & Sons, Paterson, N. J.

## Balancing Stand

THE importance of perfect balance of a tire and wheel assembly is indicated by the following engineering quotation: "There is no greater factor in the control of high speed shimmying than accurate balancing of wheel and tire assemblies. Four ounces out of balance on a 32-inch overall diameter wheel and tire assembly will develop a force of 45 pounds at 60 miles per hour. This is sufficient weight to lift the wheel off the road at each revolution and will very quickly build up a period that results in either a pronounced tramp or a very bad shimmy."

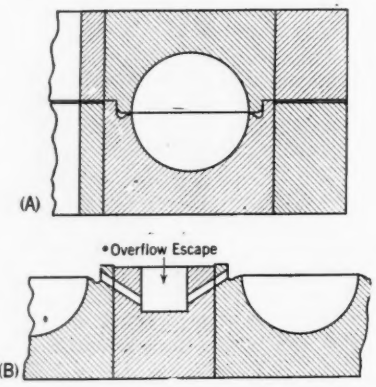
It has been found impractical to try to balance wheels on the vehicle because the slightest drag of the brake band prevents the heavy spot seeking the lowest level. Therefore the wheel balancing stand here pictured has been designed to take all types of passenger-car wheels, with or without hubs, and is accurate to ¼-ounce plus or minus, in checking balance.

The amount and location of weight needed to balance the tire and wheel assembly connection is made by an adjustable balance weight. It is designed to give any weight from two to ten ounces, and to fit between the spokes and next to the felloe of either wood or wire wheels. The weight is quickly adjustable, can be changed to any spot in a very few seconds, and is installed without removing either tire or rim. Motor Wheel Corp., Lansing, Mich.

## Golf-Ball Trimming Mold

AN IMPROVED mold for trimming golf balls is here shown in two vertical sections. Drawing *A* represents the upper and lower halves of a single cavity and exhibits the cutting edge of the lower part of the mold. Drawing *B* represents a section of the lower part of the mold at a point 90 degrees from the section indicated by diagram *A*. It shows a sloping passage drilled from the circular overflow cavity to a cylindrical well, which serves as a receptacle for the overflow trimmed from the ball.

Another special feature introduced for three-part molds is radially fitted keys, the object of which is to permit a close fit and yet allow for any uneven expansion and contraction of the mold plates. Marked differences in the rate of contraction of a multiple part mold when cooling may cause air marking of the goods or cutting of them at or near the joints of the mold plates. To obviate this occurrence in the case of a large mold, building the mold up of four plates of equal thickness is suggested. United States Tool & Machine Works, 27 Thames St., New York, N. Y.



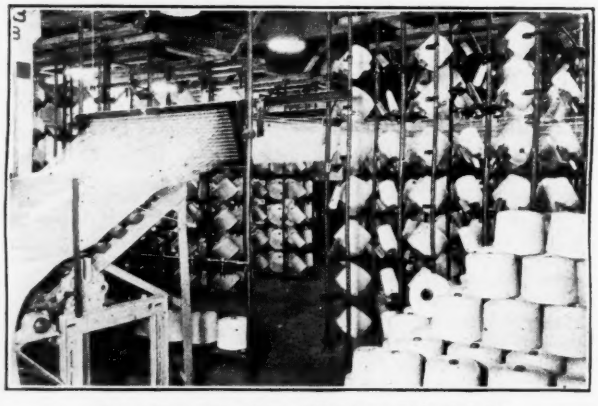

**Sections of Golf-Ball Trimming Mold: A. Overflow Cavity Cutting Edge; B. Duct and Receiving Well for Overflow Trim**

## Creel for Calendered Weftless Tire Fabric

IN THE manufacture of weftless cord fabric for use in building the carcasses of pneumatic cord tires the cones of cotton cord are supported in a frame or creel of the sort here pictured. By the arrangement of cone brackets and tensions a fabric consisting of closely parallel cords, guided by thread boards, can be drawn through a calender, and rubber treated continuously on both sides. This process greatly speeds up production and reduces costs to a minimum and results in the formation of a product in which each cord is uniformly insulated in rubber.

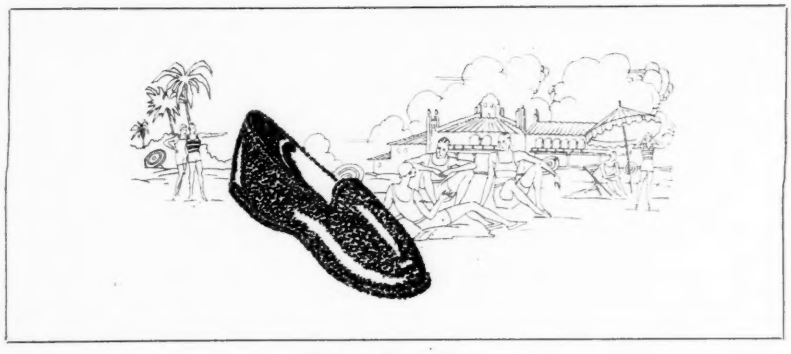
The illustration represents the rearward bays of the creel. It will be noted that the perforated thread boards guiding the course of the cords as drawn from the cones are very small at the rear of the aisle where the first cords come off. As the threads advance toward the observer, the boards are of greater size to accommodate the rapidly increasing cords joining in the assemblage from the bays on either side of the aisle. Finally the full number of cords necessary to make finished fabric of the desired width pass out of the creel through a large central thread board as shown in the picture.

The speed of this creel is practically unlimited, but it is normally worked at the rate of about 75 yards per minute. The spools or cones are arranged two to an end of cord to insure continuous operation. In other words there are double the number of spools that there are cords in the width of the fabric. Thus, as one spool is about to become empty of cord, the operator simply joins on an end from a second spool. In that way the creel is kept full for continuous delivery of material. Peter Gray & Sons, Inc., East Cambridge, Mass.



**Peter Gray Creel for Weftless Tire Fabric**

# New Goods and Specialties



Rubber Snug-Shoe

## "The Shoe That Breathes"

FOOT comfort is essential to all. That applies to shoes worn at the beach or around the house, as well as for street wear. The material used in the shoe is an important detail that must not be ignored. Now comes a company that utilizes sponge rubber in making shoes for beach or home wear. Its product is characterized as an "air-cushioned shoe," Rubber Snug, "the shoe that breathes."

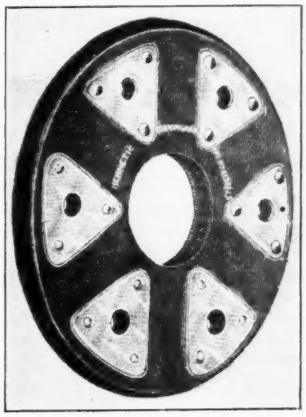
Many advantages are claimed for this new type of footwear. It gives comfort through the pliable resilient materials used, allowing the foot to take its natural form. It safeguards health because the porous material breathes in air with each step, keeping the feet dry and cool. The attractive lines of the sponge rubber shoe add beauty and grace to the foot. The daintiness of Rubber Snug is enhanced by the pleasing color combinations in which it is offered to the public.

Sponge Rubber Shoe Co., Inc., 475 Fifth Ave., New York, N. Y., also has Rubber Snug Kiddie Boots, fashioned along the same principles as the slippers for adults, designed for home wear for children.

## Flexible Fabric Coupling Disks For Motor Vehicles

THE flexible fabric coupling disk for motor vehicles here shown is constructed of highest grade Egyptian cotton fabric of maximum tensile strength. The fabric is plied between layers of best quality rubber, and is molded under great pressure during vulcanization. The center hole and all bolt and rivet holes are molded in the disk so that every ply of fabric and rubber is thoroughly consolidated. The outer surfaces and edges of the disks are protected against the entrance of moisture by a molded rubber covering.

To maintain the efficiency and extend the service of this coupling, ferruled face plates are riveted through it on each side. The ferrule of each plate is limited in length to a little less than half the normal



Hermetic Fabric Coupling Disk

thickness of the rubber and fabric construction they are designed to fit. They are fitted in pairs through the bolt-holes at front and back of the disks so that when fixed by riveting of the face plates to the coupling, there is a small gap between the two opposing ends of the ferrules in the center of the disks.

When bolted to the spider arms and tightened, the pressure causes the face plates to compress the coupling to an extent which is restricted and regulated by the simultaneous engagement of the ends of the ferrules with each other, after which no further degree of tightening is necessary and an absolutely even pressure at all points of the coupling is insured.

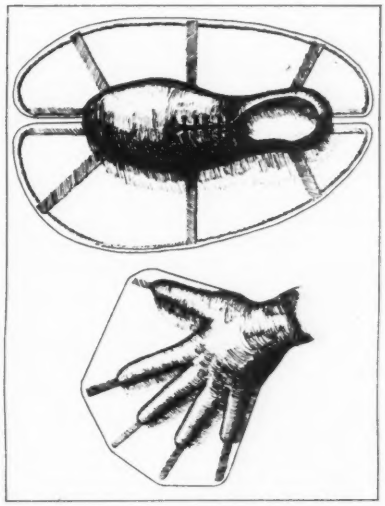
The greatly increased efficiency of this construction is particularly advantageous in the case of all commercial motor vehicles and motor busses which require the thicker and heavier type of coupling disks. Hermetic Rubber Co., Ltd., Hermetic Works, Ryland St., Birmingham, England.

## Rubber Swimming Appliances For Increased Speed

AFTER an exhaustive study to apply the fast movements of water fowl, fish, etc., to human swimmers, Aug. F. Fibiger, 320 E. Bridgeport Ave., Spokane, Wash., invented the swimming shoe and the glove here illustrated. These devices are claimed to increase swimming speed threefold and to serve as dependable support when the swimmer is tired from his exertions while still in the water, thus preventing drowning.

With slight modifications a description of the shoe will cover the glove also. The shoe is of canvas or other suitable material, provided with lacing or any other fastening device. The sole of the shoe is fashioned with surrounding extensions at front, rear, and sides. These extensions form a normally flat web of rubber material that folds along the center line of the foot as the leg is moved forward on the swimming stroke, and returns to flat position and remains extended during the backward stroke.

The web is of approximate elliptical form provided with a pair of wires embedded therein and extending around the edge of the web, but terminating at its front and rear ends and at opposite sides of the longitudinal center of the shoe and the web. Along the longitudinal center of the shoe and spaced at both sides thereof is arranged a pair of longitudinal extending reenforcing blades of resilient metal. Due to this construction and arrangement the web may be flexed or bent with a hinge movement along its longitudinal center line.



The Fibiger Improved Swimming Shoe and Glove

# Financial and Corporate News

## General Tire & Rubber Co.

The annual statement of The General Tire & Rubber Co., Akron, O., recently was released. The company's assets are listed as $15,537,062.33, only about one-third of which, or $5,323,227.16, is covered by inventory, including raw materials and goods in process and finished. Notes and accounts receivable amount to nearly twice the notes which are payable to banks, the figures being $4,109,178.79 in notes and accounts receivable as compared with $2,300,000 in notes payable to banks. A similar ratio exists between cash on hand and in banks and accounts payable. Cash on hand is reported as $1,057,656.33, while accounts payable, not due, including payroll, amount to $473,310.96. The value of the company's land, buildings, machinery, equipment, etc., less reserve for depreciation is given as $2,886,089.16, while mortgages payable on branch property amount to only $106,125. Capital stock outstanding amounts to $3,343,400 in preferred and $2,078,975 in common. The rest of the $6,000,000 authorized stock has not been issued. The surplus at the end of the fiscal year was reported as $6,779,918.63.

Gross sales for the year amounted to $27,200,160 or an increase of 4 per cent in dollars and cents over the previous year. Unit sales for the year showed an increase of 20 per cent over the preceding year. Net profits for the year were $1,970,000. During the year, dividends totaling 24 per cent on the par value of the common stock were paid and the usual preferred dividend requirements were met; the company never has failed since its organization to pay in cash its regular dividends on both classes of its stock.

## The B. F. Goodrich Co.

After the regular quarterly meeting of the board of directors of The B. F. Goodrich Co., Akron, O., on February 5, the following statement was issued:

Consolidated net sales for the fiscal year ended December 31, 1929, were approximately $164,000,000. Net income after interest, adequate depreciation on properties, and provision for federal income tax was approximately $7,400,000. Inventories of raw materials were valued at cost or market, whichever was lower on December 31, 1929, for raw materials on commitment.

Operations of Hood Rubber Co., Inc., are consolidated in the above results only during the four-month period, September 1 to December 31, 1929, inclusive, during which it operated as a Goodrich subsidiary.

The usual preferred and common dividends were declared payable as follows: $1.75 per share on preferred, payable April 1, to stockholders of record March 15, 1930, and $1.75 per share on preferred, payable July 1, to holders of record June 14, 1930; $1.00 per share on common, payable March 1, to stockholders of record February 15, 1930.

The directors also approved the retirement of 11,880 shares of preferred stock in accordance with the provisions of the charter.

## Raybestos-Manhattan Offers Stock to Employes

The directors of the Raybestos-Manhattan Co. have authorized an offering of 11,500 shares of common stock to employes, at $39 a share, the stock to carry extra compensation of 50 cents a share annually to employes holding such shares one year or more. The stock offering represents shares accumulated in the open market, and will not increase the outstanding capital of the company.

## Goodyear California Gains in Net

Goodyear Tire & Rubber Co. of California (Los Angeles) gained 21 per cent more in net profits for 1929 over 1928. The figures, according to President John W. Mapel, were: 1929, $2,293,567.55; 1928, $1,882,965.60; increase, $410,601.95; and equalling $28.68 in 1929 for each preferred share, versus $23.55 for 1928. After paying $559,699 on preferred and $1,500,000 on common stock, the surplus rose from $3,652,796.97 to $3,886,665.

Net sales for 1929 were $26,233,596; for 1928, $26,109,252. Unit sales were much larger in 1929 than in 1928, but at lower prices. Inventories were reduced to $4,892,211.29 in 1929 from $6,036,545 in 1928. Funded debt was reduced in 1929 $200,000 to $2,257,000. Cash and call loans on December 31, 1929, were $4,171,433; December 31, 1928, $3,040,595. Among depreciation items was one of $500,000 for rubber, but charged to reserves created in 1928. Total assets for 1929, $19,893,784.38, a gain of $355,701.41.

## Goodyear Textile's Gain Is Less

Goodyear Textile Mills Co., Los Angeles, Calif., the entire output of which is taken on a cost plus 10 per cent basis for the adjoining Goodyear tire factory, made but $223,871.94 net profit in 1929 versus $236,073.76 in 1928, slightly over 5 per cent decrease, or equal to $11.71 on the preferred stock, compared with $12.35 in 1928. After paying $133,721 dividends on the preferred and $85,000 on the common stock, surplus on December 31, 1929, was $375,774.92; December 31, 1928, $370,623.98. Total assets for 1929, $3,333,673.69, a gain of $1,746.93.

## Dividends Declared

| Company | Stock | Rate | Payable | Stock of Record |
|---|---|---|---|---|
| American Hard Rubber Co. | Com. | $1.50 q. | Feb. 15 | Jan. 31 |
| Boston Woven Hose & Rubber Co. | Com. | $1.50 q. | Mar. 15 | Mar. 1 |
| B. F. Goodrich Co. | Com. | $1.00 q. | Mar. 1 | Feb. 15 |
| B. F. Goodrich Co. | Pfd. | $1.75 q. | Apr. 1 | Mar. 15 |
| B. F. Goodrich Co. | Pfd. | $1.75 q. | July 1 | June 14 |
| Goodyear Tire & Rubber Co. | Com. | $1.25 q. | May 1 | Apr. 1 |
| Goodyear Tire & Rubber Co. | 1st Pfd. | $1.75 q. | Apr. 1 | Mar. 1 |
| I. B. Kleinert Rubber Co. | Com. | $0.62½ q. | Mar. 1 | Feb. 15 |
| Raybestos-Manhattan, Inc. | Com. | $0.65 q. | Mar. 15 | Feb. 28 |

## NEW INCORPORATIONS

Edge Packing & Rubber Corp., Feb. 3 (New York), capital stock 100 shares, no par value. J. Bramwell, W. E. Howley, and I. C. Gunn, all of 120 Broadway, New York, N. Y. Principal office, Manhattan. To deal in rubber specialties.

The Everett Rubber Co., Inc., Jan. 27 (New York), $10,000. F. E. Hershkowitz, F. Katz and D. C. Krengel, all of 2 Lafayette St., New York, N. Y. Principal office, Manhattan. Rubber goods.

Lido Products Co., Inc., Feb. 19 (New York), capital stock 100 shares, no par value. L. R. Crede, 354 W. 14th St., M. G. Kilhefner, 52 W. 92nd St., and M. Dombroff, 110 W. 40th St., all of New York, N. Y. Principal office, Manhattan. Rubber products.

Miller Rubber Co., Inc., Jan. 31 (Delaware), capital stock 10,000 shares, par value $100. H. E. Grantland, H. H. Snow, and L. E. Gray, all of Wilmington, Del. To purchase or otherwise acquire . . . any corporation . . . or others engaged in business permissible under the General Corporation Law.

Miller Rubber Products Co., Jan. 31 (Delaware), capital stock 1,000 shares, par value $100. H. E. Grantland, H. H. Snow, L. E. Gray, all of Wilmington, Del. To manufacture, purchase or otherwise acquire . . . import, export . . . and deal in rubber and products of which rubber is a component part . . . and in materials entering into the manufacture of any and all such goods . . . and to carry on a general rubber manufacturing and mercantile business.

Sealtite Waterproofing Co., Inc., Jan. 24 (New York), $2,500. P. D. Longyear, C. Shortmeier, both of Tottenville, N. Y., and B. P. Solar, 170 South St., New York, N. Y. Principal office, Manhattan. To deal in waterproof materials.

# The Rubber Industry in America

## OHIO

**The Dayton Rubber Mfg. Co.,** Dayton, O., has announced that George Parks has joined its sales organization as special representative. Mr. Parks, who recently resigned from the India Tire & Rubber Co., Akron, O., is well known in the tire industry especially in the East, where he has been representing prominent manufacturers since 1909, when he first joined the old Diamond Rubber Co.

**Wood Chemical Products Co.,** Cleveland, O., reports 1929 earnings of $116,182 on the class B stock, compared with $138,892 earned during the previous year. This is after taxes and other charges as well as after dividends on the class A shares. The company, organized two years ago to take over the Florida Wood Products Co., the Pensacola Tar & Turpentine Co., and the Alabama Wood Products Co., manufactures special pine-tar products used in the rubber trade, and a number of by-products, principally charcoal and flotation oils. Plants are located at Jacksonville, Fla., and Mobile and Elberta, Ala.

**Fremont Tool & Die Co.,** 434-36 N. Wood St., Fremont, O., has recently issued a handsome calendar, "Ship of State," with colored illustrations including pictures of President Hoover, Vice President Curtis, and the members of the Cabinet. On the reverse is a short biographical sketch of each.

**T. Karnaghan Seiberling,** son of C. W. Seiberling, Sr., and for the last three years head of sales in the rubber heel department of the Seiberling Rubber Co., Akron, O., on February 2 was married to Miss Mildred Townsend Kelley.

**The Erie Foundry Co.,** Erie, Pa., has closed its office in Akron, O., believing that customers in that district can be served better direct from Erie. The company has greatly expanded its line of rubber working machinery, particularly in the hydraulic press department, and builds all sizes and types of presses used in the manufacture of any plastic material. While the Erie Foundry Co. is an old, well-established manufacturer of heavy equipment, it did not enter the rubber machinery field until three years ago.

**The Goodall Rubber Co.,** Philadelphia, Pa., manufacturer of mechanical rubber goods, has announced the opening on February 1 of a branch at 1431 W. Ninth St., Cleveland, O., under the management of T. S. Stewart, who has for several years been associated with the mechanical rubber business in Cleveland. Goodall manufactures and plans to carry in stock at Cleveland "The Goodall Standard of Quality Line"—packings of every description, oiled and rubber-surfaced clothing, rubber and leather sole boots, and tarpaulins.

**Lester H. Butler,** formerly advertising manager in the Philadelphia, Pa., district for The B. F. Goodrich Co., Akron, O., has become affiliated with the Brown Advertising Agency, Akron. For seven years Mr. Butler handled Goodrich publicity, sales promotion, and advertising development work.

**The Mohawk Rubber Co.,** Akron, O., at its annual meeting on February 11 made changes in its directorate. W. L. Flory and Charles Borland joined the board to fill the vacancies made by the retirement of R. M. Phillmore and E. J. Small. Other members include S. S. Miller, J. B. Huber, and J. F. Jones. Officers of the company include S. S. Miller, president; J. B. Huber, vice president; J. F. Jones, vice president in charge of sales; and R. E. Bloch, vice president in charge of finance.

**The A-R Products Corp.,** Akron, O., manufactures a new full molded puncture-sealing inner tube under the name AR-Tite. Edgar M. Williams is president; A. T. Carnahan, sales manager; and Frank Dietriech, secretary and treasurer of the new firm, which has its general offices at 54 Cherry St.

"The AR-Tite tube does not employ the compression principle, puncture-sealing qualities being obtained through the use of a self-sealing non-flowing plastic compound," states Mr. Williams in describing the new product.

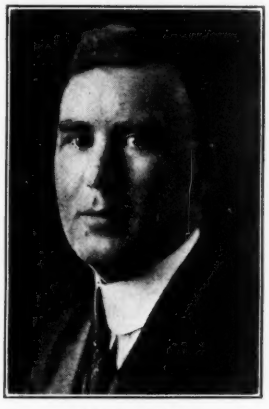
**The India Tire & Rubber Co.'s** directors, Akron, O., announced plans for the issuance of $1,300,000 in medium term notes to provide expansion for factory and distribution facilities and to cancel present indebtedness. Stockholders adopted the proposal at the annual meeting on February 10. The company intends to enlarge its dealer organization in the United States and 54 foreign countries where it has sales outlets. The refinancing, it is asserted, will make India one of the strongest financed small companies in the rubber industry.

India reported net sales for 1929 at $5,024,378.18. Earnings totaled $300,078.09. Adopting the new finance plan strengthened the company's financial position with current assets of $2,225,068 and current liabilities at $270,933, a ratio of 8.3 to 1.

The executive staff of the company was kept intact at the annual meeting

## NEW PRESIDENT, PHILADELPHIA RUBBER WORKS

When The Philadelphia Rubber Works Co., Akron, O., lost its chief executive by the death of John S. Lowman, it was confronted with the necessity of choosing a successor who could carry on capably the affairs of its organization. Unhesitatingly at the annual meeting of its board of directors on February 10 the company selected Herbert G. Day, vice president, for the position of president. A survey of Mr. Day's record reveals the wisdom of this choice.



Herbert G. Day

On May 21, 1882 in Warren, O., was born the boy who early in life demonstrated the ability which led to several promotions to his present position. He attended the Warren High School and then the Case School of Applied Science, Cleveland, O., where he majored in engineering and was graduated in 1905 with the degree of Bachelor of Science.

Then began the serious task of earning his livelihood, first in the engineering department of The Republic Iron & Steel Co., Youngstown, O., from 1905 to 1906. The next year was spent with The National Tube Co., McKeesport, Pa., followed by two years with The Hamilton Iron & Steel Co., Hamilton, O. From 1909 to 1912 Mr. Day served The Day-Ward Co., Warren, and then in January, 1912, joined The Philadelphia Rubber Works as night superintendent. A year later he was transferred to the engineering department. In 1917 he was appointed chief engineer and in 1928 was elected second vice president and general superintendent. He was elected vice president in October, 1929.

Mr. Day resides at Overwood Drive and Myopia Road, Fairlawn, O.

when all officers were reelected. The officers are: J. M. Alderfer, chairman; W. G. Klauss, president; G. W. Merz, vice president; S. W. Alderfer, secretary; W. F. Vieh, treasurer. Directors include: J. W. Alderfer, W. G. Klauss, G. W. Merz, A. T. Kingsbury, H. Lloyd Williams, P. C. Searles, and T. E. Borton.

**Philadelphia Rubber Works Co.,** Akron, O. At the annual meeting of the board of directors on February 10 Herbert G. Day was elected president. Robert W. Cooper, elected secretary and treasurer, was elected also to the board of directors. David A. Metzler continues as general superintendent, and Dr. H. A. Winklemann as chief chemist.

## New Controlling Group Suggests Goodyear Merger

Cyrus S. Eaton, of Otis & Co., Cleveland banking house, has entered the rubber industry, for it was reported and not denied that he and his associates had control of the $250,000,000 Goodyear Tire & Rubber Co., Akron, O. Mr. Eaton, Frank A. Seiberling, founder of the Goodyear company and president of the Seiberling Rubber Co., and Edgar B. Davis, personal friend of Mr. Seiberling, have actually had stock control of Goodyear for more than a year. Recently it was reported that they are likely to ask for representation on the Goodyear board. Dillon, Read & Co., Goodyear bankers, are now represented on the board only by Robert Christie, Jr., and it is understood that he and one or two other directors together with President Paul W. Litchfield elected for three years will retire this year as their terms expire. Mr. Litchfield, however, has denied reports of any merger.

Mr. Eaton's interest in Goodyear, the largest rubber company in the world, is reputed at $200,000,000 through purchases in the open market by Continental Shares, Inc., and other companies in which he is the dominating head. In addition to these interests, through his control of Goodyear the banker has an important interest in the future of air transportation through the Goodyear-Zeppelin Corp., a Goodyear subsidiary.

Mr. Eaton's control of the Goodyear organization is believed to presage several important mergers with Goodyear as the nucleus. Among possible combinations which have been mentioned is one involving a three-cornered consolidation of Goodyear with the United States Rubber Co., control of which is held by the du Pont interests of Wilmington, Del., and the Seiberling Rubber Co. The last is much smaller than the others, but F. A. Seiberling is the largest individual Goodyear stockholder and formerly had controlled the company until 1921. This merger would create a company having resources approximating $600,000,000 and sales approaching $450,000,000 yearly. If the merger materializes, it is reported that Mr. Seiberling will be chairman of the board. The possibility of U. S. Rubber joining seems, however, rather uncertain and remote.

Control is understood to be held by the Eaton group through personal holdings, Continental Shares, Inc., the Eaton-Otis & Co., Investment Trust, Goodyear Shares, Inc., a holding company for Goodyear stock, and through holdings of Edgar B. Davis and F. A. Seiberling. Continental Shares owns 75,800 shares of Goodyear common and in addition has 277 shares of the 1,000 outstanding Goodyear Shares, Inc. The latter on December 31 held 285,105 Goodyear common shares. Continental Shares' equity in Goodyear Shares, Inc., amounts to 78,945 Goodyear common shares and with its interests has a total interest of 154,745 shares in Goodyear common, or approximately 11 per cent of Goodyear's 1,398,126 shares outstanding. Mr. Davis and Mr. Seiberling are also understood to have a stock interest in Goodyear Shares, Inc.

Mr. Davis is known to favor a merger of United States Rubber and Goodyear because of the value he attaches to the former's plantations. He is a strong advocate of rubber growing by the tire manufacturers.

## Able President of The Barr Rubber Products Co.

Executive ability and wise policies have strengthened Nelt Barr's position and that of the company of which he is president, The Barr Rubber Products Co., Sandusky, O., manufacturer of toy balloons, rubber balls, bathing caps, and mechanical rubber goods. Mr. Barr has held his office since he organized the company in 1919 in Lorain, O. Five years later he moved it to Sandusky, where a fire in 1928 necessitated building a new plant on the shore of Lake Erie. Mr. Barr's connection with the rubber industry, however, began in 1916. Previously he had been engaged in the jewelry field, as a traveling salesman from Maiden Lane, New York, N. Y., from 1902 until 1907 and then in the retail business until rubber attracted his abilities.

**Nelt Barr**

Mr. Barr was born in Windsor, O., on April 24, 1882, and was educated in Ashland public schools. In 1920 he received recognition for his work in practical and theoretical physiological optics from the Ohio State Board of Optometry. Dipped goods, though, form his specialty; he has done considerable research in that phase of rubber manufacturing, and holds patents for dipped goods equipment.

His policy is to install in his plant specialized machines for every process. He employs no spectacular methods, but his fair treatment of workers has resulted in long terms of service and low labor turnover. His dealings with the trade likewise are such as to retain his customers and their invaluable good will. All these have tended to make The Barr Rubber Products Co. highly rated and financially stable.

Mr. Barr is a Mason, Knight Templar, and Elk. His address is 403 Fulton St., Sandusky.

## Firestone Operations Include New Buildings

One of the most modern rubber factory buildings has just been completed in Akron, O., at a cost of $750,000 by The Firestone Tire & Rubber Co. With the last of the machinery installed, the building began full production last month. It will increase the capacity of the Firestone plant by 50,000 tires and tubes daily. The building is seven stories high and has 100,000 square feet of floor space. It is made of steel and fireproof concrete, after the "daylight" factory plan. Combination heaters and ventilators in the ceilings operate automatically summer and winter to maintain a proper temperature inside and to circulate fresh air. Plant No. 2 offices will occupy the second floor, and the other floors will be used for factory and warehouse purposes.

Firestone laboratory experts of the company have designed a device to make airplane operation safer. It is known as a solonoid accelerometer, "scientific yardstick," to measure accurately the shocks and stresses to which various parts of an airplane, particularly the landing gears, are subjected in normal use. The instrument is adapted from the accelerometer used in tests on truck, bus, and passenger-car tires, some of which have been conducted in cooperation with the Bureau of Standards and the S. A. E.

Plans have been approved and construction is under way for a new Firestone master station at Evansville, Ind. The building, to be known as the Firestone Store & Super-Service Station, will front for 88 feet on Main St., 188 feet on Ninth St., and 83 feet on Sycamore St. It will be built of brick and concrete, and will comprise main story, mezzanine store, and basement. It will feature every line of service incidental to automobile upkeep.

Returning from a two-month business trip abroad, Samuel Broers, a vice president of Firestone Tire & Rubber Export Co., reports that Firestone's

factory in Brentford, England, production of which was recently expanded, is operating at capacity. He also said he is convinced that, although Europeans have been affected as severely as Americans by the stock market slump, economic conditions are basically sound in Europe.

## Falls-Cooper Merger Approved by Directors

Directors of the Falls Rubber Co., Cuyahoga Falls, and the Cooper Tire & Rubber Co., Findlay, both in O., voted unanimously to merge the two concerns, W. P. Cline, president of the Falls company, announced on January 31. The consolidation is based on a share-for-share exchange of common stock for stock to be issued by the new company. Present outstanding notes totaling $200,000 will be exchanged for 7 per cent bonds of the merged company. One share of Falls preferred is to be exchanged for two and one-half shares of new company common stock, while one share of Cooper preferred will be exchanged for one share of new preferred and one-half share of new common. Final action was postponed until February 27 as stockholders of each company discussed the project on February 17.

Combined assets would equal $4,000,000 of which $2,100,000 would be current compared with $625,000 of current liabilities. Working capital would amount to $1,500,000 while combined sales will be between $6,000,000 and $7,000,000.

Plants of both concerns will be kept in operation under present plans, with products of each organization to be manufactured under present identifications. No change will be made in connection with dealer organizations.

## Akron Rubber Group, A. C. S., Meeting

A MILL MAN WAS WARMING A BATCH OF ing on February 17 at 6:30 p. m. After a dinner at the dining-room of The Goodyear Tire & Rubber Co., Akron, O., the gathering of 150 members went to Goodyear Theater, where the meeting was held.

A paper written by H. C. Young, Works Director of the English Dunlop Co., Birmingham, England, was read. Lantern slides were used to illustrate this paper, which was of a highly technical nature, dealing with wasted horsepower from motors as compared with wasted manpower from individual units, with installation of cooling processes, and an effort to determine the exact point where rubber will mix the best.

A most interesting discussion followed with R. R. Jones and H. K. Jennings, of Firestone Tire & Rubber Co., discussing the part of Mr. Young's paper relating to horsepower and manpower. R. E. Davison, The B. F. Goodrich Co., discussed tubing machines; Roy W. Brown, Firestone Tire & Rubber Co., and H. A. Davis, Goodyear Tire & Rubber Co., spoke on mill cooling. Others who took part in the symposium were: W. E. Waters, H. H. Baird, J. Grotzinger, and W. H. Welch, all of Goodyear Tire & Rubber Co., and S. P. Regal, Philadelphia Rubber Works.

## Goodyear Activities in Foreign Countries

Promotion of F. T. Magennis to the post of manager of the Goodyear Tire & Rubber Co. of South America in Brazil, with headquarters in Sao Paulo,

**F. T. Magennis**

has been announced by Goodyear officials in Akron, O. Mr. Magennis returned to Akron recently from Cuba, where he was vice president of the Goodyear Tire & Rubber Co. of Cuba for two years, to prepare for his new post.

He was born in Philadelphia, Pa., on October 3, 1896. He came to Akron with his parents in 1899, attended Akron U. for three years and was graduated from the University of Michigan in 1917 with the degree of Bachelor of Arts. With the exception of several months in World War service he has been associated with Goodyear since 1917 in Central America, Colombia, Peru, Ecuador, Bolivia, Chile, British, French, and Dutch West Indies, the Guianas, and Venezuela.

J. W. Riveire has been appointed vice president of the Goodyear Cuban company to succeed Mr. Magennis.

Improved strains of rubber trees which will double the production of crude rubber per acre under cultivation have been developed and are being planted in the 40,000-acre Wingfoot estate in Sumatra, according to John Ingle, director of Goodyear interests in Sumatra and Singapore, who has returned to Akron after thirteen years spent for Goodyear in the Orient.

Goodyear's 20,000-acre Dolok Merangir estate is 70 miles southwest of Medan, the principal city of Sumatra. There 16,000 acres are already in production.

C. E. Falor, of the Goodyear by-products division, has been honored by the company by the presentation of a 25-year service pin in recognition of his years of service.

## Goodrich Subsidiaries Follow Miller Merger

The merger of the Miller Rubber Co. with The B. F. Goodrich Co., both of Akron, O., forming the second largest rubber company in the world, was approved by Miller stockholders. In the preferred group at the meeting 85,014 shareholders voted for the merger, while 450 disapproved. Common stockholders in favor of the union numbered 193,385, with 310 dissenting. Their vote completes the deal previously approved by the directors of both companies. It will not, however, stop litigation already started, or which may be started, by dissenting stockholders who seek remuneration in full for their holdings or a receiver for the Miller company.

Following the acquisition of the Miller company on February 18, the Goodrich company announced the formation of two subsidiaries to take over Miller activities. These subsidiaries, organized under the laws of Delaware, are Miller Rubber Co., Inc., the manufacturing company, and Miller Rubber Products Co., a sales and distributing firm.

Executive officers are J. D. Tew, president; T. G. Graham, vice president; V. I. Montenyohl, treasurer; and S. M. Jett, secretary.

R. T. Griffiths has been appointed vice-president and general manager of the Miller Rubber Co., Inc. He has full charge of all factory activities, and for the present is directly in charge of all sales except tires, tubes, and accessories.

T. G. Graham, Goodrich's first vice president, will, with L. C. Rockhill and his organization, work out a solution for selling Miller tires, tubes, and accessories. As soon as convenient, J. H. Connors, general manager of Goodrich mechanical goods division, will relieve Mr. Griffiths of the sale of heels and soles. Meanwhile he will be in charge of the heel and sole division of Miller company. Mr. Griffiths will continue as head of the footwear division until A. B. Newhall, who is in charge of all footwear matters of the Hood and Goodrich companies, can arrange to take over Miller footwear sales.

The divisions covering druggists' sundries, specialties, toys, pen sacs, etc., will continue with Mr. Griffiths in complete charge of manufacturing and sales. Other divisions will be expanded by adding items to be manufactured for Goodrich.

A mill man was warming a batch of stock, and the end of the batch flopped over on his left hand, pulling it into the bite of the rolls. The injury sustained resulted in the amputation of the first three fingers on his injured hand. This accident was charged with 1,200 days lost. *Rubber Section News Letter*, N. S. C.

# NEW JERSEY

The output of rubber goods in New Jersey is increasing and the outlook, manufacturers say, is most encouraging. The situation began to improve after the first of the year, and conditions are expected to remain normal. Orders for belting and packing show a steady increase; while production of tires and tubes remains good. Plants producing hard rubber goods report improved business. Little change occurred in orders for rubber soles and heels.

**The Rubber Manufacturers' Association of New Jersey** held its late winter dinner-meeting on February 11 at the Trenton Club, Trenton, N. J. A. L. Viles, general manager of the Rubber Manufacturers' Association, Inc., was present and talked on rubber trade conditions, which he said, seem very promising.

**The Ewing Rubber Co.,** Trenton, N. J., suffered loss by fire on January 25, when flames originating in the mixing room damaged a portion of the plant. The room was burned from the building and the interior damaged. Officials say the blaze will not interfere with the operation of the plant. The company was recently incorporated.

**The Pocono Rubber Cloth Co.,** Trenton, N. J., states that business shows signs of improvement and that the smaller jobbers are beginning to place orders for the spring trade.

**Edward J. Sweeney,** formerly of Trenton, N. J., has been appointed general manager of the Walton Tire Service, Inc., Philadelphia, Pa., Mr. Sweeney was once territory salesman for the Firestone Tire & Rubber Co. in Philadelphia and previous to that was affiliated with the United Tire Co., Camden, N. J. He is a brother to Bernard E. and Thomas E. Sweeney, of the Sweeney Tire Service, Inc., Trenton.

**Quartermaster General C. Edward Murray,** president of the Crescent Insulated Wire & Cable Co. and former head of the Empire Rubber Co., both of Trenton, N. J., will be given a testimonial dinner on March 8 by the members of the Wayside Club. General Murray has occupied the state military office for twenty-five years, having been appointed on March 8, 1905.

**William T. Malone, Jr.,** president of the General Supply & Chemical Co., Trenton, N. J., recently addressed the Trenton Rotary Club on rubber reclaiming. He claimed that reclaiming is one of the most important divisions of the rubber industry both from an economic and a technical viewpoint, for the reason that its products are virtually indispensable. He further declared that no class of compounding ingredient in the rubber industry has met with success equal to reclaim, that this material is properly classified as rubber and is steadily gaining in consumption year by year.

**The Mercer Rubber Co.,** Hamilton Square, N. J., was the first rubber concern in this section to have a telephone installed in its plant, according to the New Jersey Bell Telephone Co. The installation took place fifty years ago.

William H. Sayen, Mercer president, who served as foreman of the Mercer County Grand Jury, was presented with a handsome traveling bag by fellow members of the jury at a banquet.

I. Ely Reed, vice president and general manager of the Mercer company, has returned from a business trip to Texas, Louisiana, and the midwest states. He reported improved trade conditions and a good outlook.

**Pierce-Roberts Rubber Co.,** Trenton, N. J., announces increased business with no dull season in view.

**Whitehead Bros. Rubber Co.,** Trenton, N. J., reports satisfactory business in hose and belting departments. The company is operating five days a week and expects to increase working hours in the early spring.

**The Puritan Rubber Co.,** Trenton, N. J., experienced improved business conditions with more plentiful orders.

**The Michelin Tire Co.,** Milltown, N. J., has appointed the Richmond Tire Shop, Trenton, N. J., as an exclusive dealer for Michelin tires and tubes.

**The Joseph Stokes Rubber Co.,** Trenton, N. J., announced a decided improvement in hard rubber production and increased orders for spring delivery.

**Clarence Dudley Wilson,** secretary-treasurer of the Luzerne Rubber Co., Trenton, N. J., is a member of the Federal Grand Jury at Trenton, N. J.

**Robert J. Stokes,** president of the Thermoid Company, Trenton, N. J., is spending several weeks in Cuba. He is on a combined pleasure and business trip.

**Carl F. Ogren,** director of research and automotive engineers of the Thermoid Company, Trenton, N. J., spoke about asbestos at the recent annual meeting of the Trenton Chapter, American Business Club, Trenton, N. J. He told how asbestos was manufactured and the ingredients used.

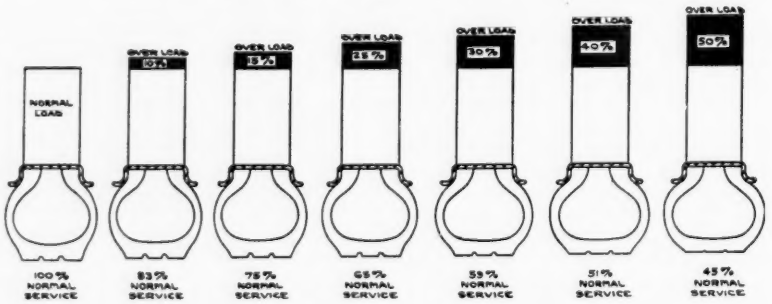
**Carlyle W. Myers,** formerly general manager of the Virginia Carolina Rubber Co., Inc., Richmond, Va., has been elected vice president of the Dexter Rubber Mfg. Co., Goshen, N. J., in direct charge of advertising and sales. Mr. Myers is closely identified with the rubber and wholesale automotive industry, having introduced the Va-Car automatic principle of tire repair.

Dexter plant facilities have been increased from a capacity of 1,500,000 pounds of rubber products to 8,000,000 pounds. A new automobile accessory is the Stick-Rite Flap for Model "A" Ford rims, a duck flap coated on one side with a tacky self-vulcanizing face to be used in replacing the cork and paper protection that accompanies original equipment. When applied, it fits the well of the rim, permanently vulcanizing itself without possibility of slipping or buckling, and prevents contact of rusty rim and tube.

A new department has been added for manufacturing friction and rubber tapes to be made in two grades of each, standard and high test. A development of this department is Twin Tape, of new patented process which includes combination of rubber and friction tape in single unit.

**The Home Rubber Co.,** Trenton, N. J., is manufacturing two brands of transmission belting of distinctive merit. Both are of the friction surface type. One, known as "Jumbo," has a red friction surface, and is built for all-around heavy service. The other, branded "Radio," distinguishable by its yellow friction surface, is designed for high speeds.

## Load and Service Diagram—Pneumatic Tires




| | Lbs. | Lbs. | Lbs. | Lbs. | Lbs. | Lbs. | Lbs. |
|---|---|---|---|---|---|---|---|
| 30x5 | 1,700 | 1,900 | 1,950 | 2,150 | 2,200 | 2,400 | 2,550 |
| 32x6 | 2,200 | 2,400 | 2,550 | 2,750 | 2,850 | 3,100 | 3,300 |
| 36x6 | 2,500 | 2,750 | 2,900 | 3,150 | 3,250 | 3,500 | 3,750 |
| 34x7 | 2,800 | 3,100 | 3,200 | 3,500 | 3,650 | 3,900 | 4,200 |
| 38x7 | 3,200 | 3,500 | 3,700 | 4,000 | 4,150 | 4,500 | 4,800 |
| 36x8 | 3,600 | 4,000 | 4,150 | 4,500 | 4,700 | 5,050 | 5,400 |
| 40x8 | 4,000 | 4,400 | 4,600 | 5,000 | 5,200 | 5,600 | 6,000 |
| 38x9 | 4,500 | 4,950 | 5,200 | 5,650 | 5,850 | 6,300 | 6,750 |
| 42x9 | 5,000 | 5,500 | 5,750 | 6,250 | 6,500 | 7,000 | 7,500 |

*Technical Service Division, U. S. Rubber Co.*

# NEW ENGLAND

**The United States Rubber Co.** has sold the felt machinery, equipment, and good will of its subsidiary, the Lawrence Felting Plant, Millville, Mass., to the American Felt Co., Boston, Mass. As a result, the felt departments of the acquired company ceased operations on January 31, but the fabric departments will continue. About seventy-five employes were affected by the closing of the former sections. Officials of the Millville plant, however, state that the question of pensions and termination wages will be taken up shortly.

**Davidson Rubber Co.,** 50 Brighton St., Boston, Mass., manufacturer of hot water bottles, fountain syringes, and nipples, has announced that Harold S. Liddick, formerly chief chemist with Seiberling Latex Products Co., Barberton, O., is now affiliated with the Davidson organization in a similar capacity.

**Massachusetts Savings Bank League** recently filed papers of incorporation. Its purpose as an educational corporation to be conducted without profit is to make the public better acquainted with the advantages of savings bank life insurance. Included among the directors are J. William Fellows, assistant to the president of the Boston Woven Hose & Rubber Co., and Enoch B. Robertson, general superintendent of the American Rubber Co.

**Charles C. Goodrich,** member of the board of directors of The B. F. Goodrich Co. and a resident of York Harbor, Me., has announced his candidacy for the house of representatives of the Maine general assembly. He will run on the Republican ticket, and, it is said, will meet with little opposition.

**The Fisk Rubber Co.,** Chicopee Falls, Mass., has made public the resignation, effective March 15, of R. B. McGaw, its treasurer and clerk for nine years and associated with the company for twenty years. Mr. McGaw, however, has not yet disclosed his plans for the future.

**The B. F. Goodrich Rubber Co.,** Akron, O., is concentrating its several scattered departments in New England in its new three-story building, 109 Brookline Ave., Boston, Mass. Joe Buckley, Boston branch manager responsible for this change, states that the coordination of all of the various divisions under one roof will provide for an even better and quicker service to thousands of customers all over New England. Boston operating manager, Dick Knight, who has planned the commodious and thoroughly modern arrangements, is now departmentizing the building so that the tires, footwear, mechanical, sole and heel, and all other branches will be properly housed.

**The New Haven Sherardizing Co.,** Hartford, Conn., at a meeting of the stockholders on February 18 voted to change its name to The National Sherardizing & Machine Co., since the company has become national in scope, especially in sherardizing equipment and machinery, supplying even the entire world with these products. Both its plants, at Hartford and Akron, O., in addition to supplying the trade with sherardizing equipment and machinery, have, of course, many other outlets, such as chrome, udylite, copper and nickel plating, as well as the two largest individual sherardizing units in the country.

**The Rubber Regenerating Co.,** Naugatuck, Conn., and **The Naugatuck Chemical Co.,** New York, N. Y., subsidiaries of the United States Rubber Co., hitherto operated separately, have been combined as a unit. Elmer Roberts, general manager of The Naugatuck Chemical Co., is now manager of the combined plants, which will be known as the chemical and the reclaiming departments.

**The Beacon Falls Rubber Shoe Co.'s** manufacturing activities will be moved to Naugatuck, Conn., during the current year, according to the announcement made on February 19 by C. E. Little, president of the company. Arrangements have been made for space in the Goodyear's Metallic Rubber Shoe Co. plant at Naugatuck. As the new location is only three miles from the present factory, the majority of the present employes will be retained. Mr. Little explained that the move is to be made to provide the Beacon Falls company with better facilities. The buildings now occupied date back to 1853. The Naugatuck location will afford the most modern facilities for this particular line of manufacture.

**The United States Rubber Co.'s** program of expansion and reorganization, started last year, has been materially advanced since the beginning of the new year. When completed, the enlarged factories of the corporation on Valley St., Providence, R. I., will eventually afford employment to about 4,000. The story behind the local expansion of the company's activities is, that after control had been secured by the du Pont interests, a program was inaugurated to simplify and consolidate its far-flung activities with the result that Providence was made the center of the sundries division. This division, termed the fastest growing department of the company by its officials, was placed under new management, and plans have been announced which will result in materially increased employment in the local plants. The consolidated sundries department is under the direction of H. W. Waite, as general manager, with C. A. Blake, assistant general manager. During the past fall a construction program was started with the erection of a unit 100 by 300 feet for the manufacture of rubber floor coverings, and work on a second building, 250 by 80 feet, is already well under way.

The rubber company's Alice Mill at Woonsocket and plant at Millville suspended making gaiters and arctics from February 7 to March 3, when samples were made and preparations perfected for producing new lines. This suspension affected about 400 of the 1,800 employes, although they had some work during the period. They had been on a steady 5½-day week, and regular operations will be resumed on new products. The other departments were not affected but continued production on regular schedules. Both of these plants, which are engaged in the manufacture of rubber footwear, experienced a profitable year during 1929, according to Factory Manager Wilmot. Additional gain in operations was attributed to closing several rubber shoe manufacturing subsidiaries of the U. S. Rubber Co., in other states, a substantial portion of the operations of these abandoned plants being transferred to Rhode Island, especially to the Woonsocket units.

**The American Wringer Co.,** Woonsocket, R. I., has been forced to employ a night shift in the heavy roll department to meet bookings. These rolls are a highly specialized product, as a different compound of rubber is required for almost every kind of roll, depending on the use for which it is intended. This activity in the opening months of the new year is especially pleasing to management and employes alike as continuing the remarkable improvement in operations and profits reported by the company for 1929. This concern, once a prosperous enterprise, was forced into receivership a few years ago, but since its reorganization steady progress has been made; the climax was reached last year when funded debt and preferred stock issues were retired. This rejuvenation resulted from a complete change in production programs, whereby the old product, hand wringers, was abandoned in favor of new products which have found steadily increasing demand.

At the annual meeting of the stockholders, held on January 27, Harold T. Merriman was reelected president and treasurer; Frederick W. Howe was named vice president; George R. Keltie was renamed secretary and general manager; and A. G. Gobielle was chosen assistant treasurer. The board of directors was reelected for the ensuing year by the stockholders, who received from officials encouraging reports concerning operations during the past twelve months and the announcement that the company enters the new year with a large number of orders on hand.

**The National India Rubber Co.,** Bristol, R. I., recently made the following appointments and changes in its factory forces: E. G. Brown became assistant factory manager of the wire division, in direct charge of the manufacture of wire. He was formerly connected with the engineering department of the United States Rubber Co.,

New Haven, Conn. Lester K. Munroe, assistant treasurer at the National plant, has been announced as central manager of the company. J. B. Pollock has been transferred from foreman of the machine cutting department to foreman of the spreader department, succeeded by Edward Flanagan, who was assistant foreman of the making department. Matthew Capone has been re-elected chairman of the Factory Council, the other officers of which are: vice chairman, Raymond Cavallare; chairman of the Keds Production Committee, Saverio Rinaldi; chairman of the Keds Working Conditions Committee, Raymond Cavallare; chairman of the Wire Working Conditions Committee, Walter Bullock; and chairman of the General Service Committee, Joseph Sylvia.

## United States Rubber Co.

F. B. Davis, Jr., chairman of the board and president, has announced that at a meeting of the board of directors of the United States Rubber Co., New York, N. Y., held on February 4 Charles H. Sabin, chairman of the board of the Guaranty Trust Co. of New York, and David Dwight Douglas, president of the First National Bank, Detroit, Mich., were elected to the board of the rubber company. Mr. Sabin was also elected a member of the finance committee.

The company has announced also the appointment of L. L. McClintock, for the past eighteen years connected with The Firestone Tire & Rubber Co., as district manager of tire sales of the New York district, comprising the metropolitan area and adjacent territory. Though one of the youngest tire executives in the city, Mr. McClintock has been conspicuously successful in sales development work in New York for the past ten years.

H. Stuart Hotchkiss, vice president of the parent company, chairman of the board of directors of the General Rubber Co., and president of the United States Rubber Plantations, Inc., has resigned these connections. Mr. Hotchkiss has been associated with the United States Rubber Co. and its subsidiaries for more than twenty-nine years.

John Warren Bicknell, managing director of United States Rubber Plantations, Inc., will be elected president of that company, with headquarters in the East. He was born at Malden, Mass., on December 5, 1886, and was graduated from Harvard in 1909. He joined the United States Rubber Co. in December, 1910, and spent most of his time with its plantation subsidiaries in the Far East, becoming an authority on rubber cultivation.

THE RECENT LAW PROHIBITING THE USE of solid motor-car tires in Norway does not prevent the employment of semi-pneumatic tires of a recognized type under loads exceeding 3,600 kilos.

# EASTERN AND SOUTHERN

**Dr. S. E. Sheppard,** assistant director of the research department of the Eastman Kodak Co., Rochester, N. Y., has been awarded the William H. Nichols Medal of the New York Section of the American Chemical Society. Presentation of the medal, which is bestowed for outstanding achievement in the chemistry of photography, will be made on March 14 at the Chemists Club, 52 E. 42nd St., New York, N. Y. In the field of rubber research Dr. Sheppard is noted for his discoveries and patents on the electro-deposition of rubber.

**The B. F. Goodrich Co.,** has announced that R. J. Jones, formerly manager of footwear sales of its Boston, Mass., branch, has been advanced to the New York, N. Y., district, where he will act in the same capacity. Although originally a Boston man, Mr. Jones returned to that city two years ago from the New York office, of which he had been assistant manager.

**United Tire Stores Corp.,** 11 E. 44th St., New York, N. Y., the recently organized buying agency for a combination of retail tire stores, has chosen "Mercury" as the name under which it will distribute its tires and tubes and any other products it may later adopt. Since most of the necessary arrangements were complete, shipments of tires and tubes to stockholders started about February 15.

**T. A. Desmond & Co., Inc.,** crude rubber importer, has announced the removal of its offices from 29 Broadway to 33 Rector St., New York, N. Y. Telephones: Bowling Green 9250-53.

**C. J. Welch,** manager of car distributer sales of the United States Rubber Co., New York, N. Y., has resigned to become president of the Mercantile Tire Co., 232 W. 58th St., New York, in which he has taken an interest. The Mercantile Tire Co. is an established tire distributing concern handling U. S. products. Mr. Welch, who started with the rubber company as a youngster, has fortified himself with an adequate knowledge of the tire business and a broad acquaintance of business men and affairs. He was at one time manager of the solid truck tire department and later assistant general sales manager. His work in handling sales of tires to automobile and motor truck distributers throughout the country has broadened and solidified his experience, giving him keen insight into national sales requirements.

**Bruce C. Dodd,** district sales manager at the Bulk Plant of the Anderson-Prichard Oil Corp., Akron, O., spent January 9 in conference with Douglas G. Stewart, purchasing agent for E. I. du Pont de Nemours & Co., Wilmington, Del.

**Justin R. Weddel,** formerly with Pedlar & Ryan, Inc., New York, N. Y., has joined Erwin, Wasey & Co., Ltd., and will make his headquarters in London, England.

**H. Hentz & Co.,** 60 Beaver St., New York, N. Y., has announced that Robert L. Baird, formerly with the Baird Rubber & Trading Co., has joined the Hentz company as manager of the rubber department with headquarters at the main office, 60 Beaver St.

**F. R. Henderson,** president of The Rubber Exchange of New York and the F. R. Henderson Corp., both of New York, N. Y., has formed the Basic Commodities Corp., a $7,000,000 company, to invest primarily in essential commodities and raw materials.

**Lucien King,** recently with the Outdoor Advertising Agency of America, Inc., and for fourteen years advertising manager of The Goodyear Tire & Rubber Co., Akron, O., has joined Erwin, Wasey & Co., New York, N. Y., as an account executive.

**G. F. Hichborn,** general traffic manager of the United States Rubber Co., New York, N. Y., is head of a committee consisting of representative traffic men recently appointed to cooperate with a subcommittee of President Herbert Hoover's committee of railroad presidents in a study of the freight-handling situation in the metropolitan district of New York.

**Bolta Rubber Co.,** manufacturer of hard rubber products, Lawrence, Mass., has a New York office at 27-33 W. 23rd St., New York, N. Y.

**H. W. Butterworth & Sons Co.,** 2415 E. York St., Philadelphia, Pa., manufacturer of textile finishing machinery, has completed several organization changes. All sales activities have been placed under Vice President J. Ebert Butterworth, who has been in charge of the southern office for the past several years. He will, however, be located permanently in Philadelphia. J. Hill Zahn, associated with Mr. Butterworth in the South, has been made manager of the southern office in Charlotte, N. C. Effective since February 1 the executive and sales offices of the Klauder Weldon Dyeing Machine Division, Bethayres, Pa., have been consolidated with the Philadelphia sales department. The Bethayres plant is now known as plant No. 2—H. W. Butterworth & Sons Co., instead of the Klauder Weldon Dyeing Machine Division.

The Butterworth company has become licensee for the production of Meehanite metal, some of the features of which are its ability to withstand wear, erosion, and corrosion, made by the Meehanite Metal Corp., Chattanooga, Tenn. It can be made with a tensile strength of 70,000 pounds, and takes an extremely high polish.

**Cutler-Hammer, Inc.,** pioneer manufacturer of electrical control apparatus, Milwaukee, Wis., has announced the appointment of Frank J. Burd, as manager of the Philadelphia office. Mr. Burd, who replaces T. E. Beddoe, resigned, has been

with Cutler-Hammer many years at Chicago and Pittsburgh.

**The Birmingham Tire & Rubber Co.,** Birmingham, Ala., has been reorganized under the name of the Birmingham Rubber Products Co. and in the future will manufacture mechanical rubber goods as well as tires and tubes. New equipment and improvements are being provided at the North Birmingham plant, and operations began on March 1. Douglas Arant is president; Joseph F. Keuch, formerly with the Kokomo Tire & Rubber Co., Kokomo, Ind., is general manager; and A. H. Stearns, formerly with the New York exporting branch of the United States Rubber Co., is sales manager.

**W. E. Fouse,** vice president of the General Tire & Rubber Co., Akron, O., is wintering in Florida, where for the first time he recently saw his new winter residence which Mrs. Fouse purchased a year ago.

**Harvey S. Firestone, Sr.,** president of The Firestone Tire & Rubber Co., Akron, O., was one of the guests at the unveiling of a bronze tablet in honor of Thomas A. Edison at Fort Myers, Fla., on the noted inventor's eighty-third birthday on February 11. Mr. Edison spent much of the day in the company of his cronies, Henry Ford and Mr. Firestone. When questioned on the subject by press representatives, Mr. Edison said that he was satisfied with his progress with his rubber experiments, and that it is real, not synthetic rubber, that he is trying to produce.

## Westinghouse Salute to The Rubber Industry

On Tuesday, March 11, 1930, from 10:00 to 10:30 P. M., Eastern Standard Time, the Westinghouse Electric & Manufacturing Co. will broadcast over a network of thirty-two stations extending from coast to coast, as one of its series of radio programs based upon great modern industries, tribute to one of the youngest of our basic industries, and yet one that is indispensable to all —the rubber manufacturing industry. The program will include, besides music, a brief history of the industry and an address by a prominent rubber man.

### File Census Reports

Department of Commerce, Bureau of Census, Washington, D. C., is conducting the 1929 Census of Manufactures. To be of greatest practical value, Census of Manufactures Reports must be timely; so the prompt and accurate cooperation of manufacturers is requested. It takes the Census Bureau only three weeks to publish the preliminary report for an industry, after all the manufacturers in the industry have filed acceptable returns. Practically the entire delay in getting out census reports is due to the manufacturers themselves.

# MIDWEST

**The St. Clair Rubber Co.,** Marysville, Mich., according to C. A. Pfeffer, general manager, has announced the appointment of D. C. Bayne as assistant sales manager with headquarters at the company's main office in Detroit. He has held various responsible executive positions in the rubber industry.

**The Falk Corp.,** Milwaukee, Wis., has completed arrangements with two new representatives, Youngstown Steel Sales, Inc., Youngstown, O., and Root, Neal & Co., Buffalo, N. Y. Full information relative to all Falk products will be available through Youngstown. The Buffalo selling outlet will be given sales cooperation and help in accordance with the Falk policy. Products to be handled by these two agents include parallel shaft and right angle speed reducers, herringbone gears for all purposes, special gear drives of any size, and flexible shaft couplings.

## United States Rubber Co. *Tire Department Activities*

William C. Blake, manager of the motor coach and taxi cab tire sales of the United States Rubber Co., Tire Department, Detroit, Mich., announces the appointment of Carl Burdick Cadwell as special field representative. He has been in tire sales work for eighteen years with one of the most prominent companies in the industry. For the past twelve years he has been district manager in the Northwest.

**Carl B. Cadwell**

Mr. Blake reports also appointment of Allan M. Leach as representative in the Southeastern Division of the motor coach and cab tire sales. Mr. Leach is well known in the tire industry, having spent the past eleven years as a sales and special technical field service representative. For ten of these years he has been with the United States Rubber Co. with headquarters in Atlanta, Ga., and Raleigh, N. C.

**Peerless Rubber Co.,** manufacturer of sponge rubber products, has returned to its old location, 536 Shelby St., Room 202, Detroit, Mich. John F. Barron is representative.

**American Management Association,** Industrial Marketing Division, will hold its first Industrial Marketing Conference at the Blackstone Hotel, Chicago, Ill., on March 5 and 6, 1930. Among the speakers will be Walter Emery, of the United States Rubber Co.

**The Firestone Service Store, Inc.,** Vincennes, Ind., recently opened at its new location, Ninth and Main Sts. George Flack is manager.

**The C. F. Pease Co.,** 813-21 N. Franklin St., Chicago, Ill., manufacturer of blue-printing machinery, has announced the appointment of Advertising Manager W. Earle Pashley to assistant sales manager and second vice president. Simultaneously, he was elected to the board of directors, and in addition to his new duties will continue in charge of advertising and all promotional activities of the company.

**Thiokol Corp.,** 930 Wyandotte St., Kansas City, Mo., through Vice President Joseph C. Patrick issues the statement that it has not and never has had any connection with the Industrial Testing Laboratory, although at one time they both had offices in the same building.

**Cutler-Hammer, Inc.,** Milwaukee, Wis., pioneer manufacturer of electric control equipment, has announced that since February 10 its Detroit, Mich., district sales office has been located at 2755 E. Grand Blvd. The new location includes warehouse facilities where standard C-H products will be carried for immediate delivery.

## A. S. T. M. Regional Meeting

An all-day regional meeting followed by a banquet in the evening will be held by the American Society for Testing Materials at Book-Cadillac Hotel, Detroit, March 19, 1930. The general topic of the meeting will be a symposium on development in automotive materials. The morning session will be devoted to metals, and the afternoon session to miscellaneous materials. In the latter group a paper, "Advances in Rubber for Automotive Use," will be presented by Walter C. Keys, Chief Engineer, Automotive Development Department, United States Rubber Co.

### Sulphur in the Rubber Industry

Vulcanization by sulphur is basic in the rubber industry and consumes a relatively moderate but increasing proportion of the annual sulphur production. The estimated total consumption of sulphur in the United States was 1,350,000 long tons in 1927 and 1,426,000 long tons in 1928. Of these amounts the rubber industry used 35,000 tons in 1927 and 40,000 tons in 1928.

# PACIFIC COAST

**United States Rubber Co.,** according to J. B. Brady, general manager at San Francisco, Calif., has had a striking pick-up in tire, footwear, general mechanicals, and druggists' sundries since the first of the year, and the outlook is very encouraging. Notable, too, have been the installations of rubber flooring for office buildings. Recently the company negotiated one of the largest contracts for such flooring in the Hawaiian Islands. Mr. Brady announces the appointment as regional manager of G. & J. tire sales of A. L. Bronaugh who had been assistant to tire sales manager C. W. Ort at the Los Angeles, Calif., branch. Mr. Bronaugh will aid J. B. Magee, general manager of tire sales for the Coast Division at San Francisco. The new compensation plans, somewhat akin to those adopted by General Motors Corp., which were recently explained to the coast sales force at several conferences by executives from the company's main offices at Detroit, Mich., will shortly be put into effect. They are said to have met with general and enthusiastic approval.

**Firestone Tire & Rubber Co. of California** has practically completed the additions to its big plant in Los Angeles, Calif. Some delay in installing the machinery will, according to Vice President and General Manager R. J. Cope, prevent the company from starting operations in the new buildings until March 1, and production will not be doubled until about June 1. Vice President and General Sales Manager R. C. Tucker announces the appointment of Chester A. Turney as merchandising manager, who will have relations with some 3,300 Firestone dealers in the eleven farwestern states.

A contract has been awarded for the erection of a Firestone service station to cost over $100,000 in Oakland, Calif.

**Dayton Rubber Mfg. Co.,** Dayton, O., which recently made with Nelson & Price, Inc., Los Angeles, Calif., one of the largest contracts for dealer distribution ever executed by any tire-making concern, will shortly decide the much-mooted question as to the establishment in the Southwest of a branch factory to take care of not only the Nelson & Price requirements but also those of all other distributers in the far west section. Vice President D. W. Warden of the Dayton company arrived in Los Angeles on February 16 and arranged to make a final survey of the territory to be served, during a two weeks' stay. Upon his report will depend, it is said, the decision of the Dayton directors, which is expected at an early date. It is unofficially stated that a minimum of $2,000,000 annual sales is already assured.

**Goodyear Tire & Rubber Co.,** Los Angeles, Calif., has already achieved a production somewhat over that for the same period last year. The factory was visited in the latter part of February by Paul W. Litchfield, chairman of the board of the parent Goodyear company at Akron, O. The company announces the appointment of Porter D. Collins, heretofore of Grand Rapids, Mich., as branch manager in San Francisco, Calif., taking the place of R. H. Daniels, now assistant sales manager at the Los Angeles branch.

**F. W. Stavely,** Firestone Tire & Rubber Co. of California, is new chairman of the Los Angeles Rubber Group of the American Chemical Society.

**Sherbondy Rubber Co.,** Norwalk, Calif., it is stated by President E. L. Sherbondy, finds business quite good with an excellent outlook. The factory's mill capacity was doubled recently and additions are being made monthly to the other mechanical units. Hard rubber products are selling particularly well, especially toilet seats made in all colors but white. Other products are packings for oil pumps, tire repair stock, and general mechanicals. The company will resume within sixty days the making of Sherbondy non-puncturable tires, which have been much improved since being put on the market a few years ago. The company is equipped to reclaim sufficient rubber for its various needs. The other officers besides Mr. Sherbondy are: vice president, Adam Layer, secretary-treasurer, Geo. Ledoux, who with Dr. J. A. Ledoux and Superintendent Howard Sherbondy form the directorate.

**West American Rubber Co.,** Los Angeles, Calif., according to President Douglas Radford, found business for the past couple of months better than for the same period in 1929, and prospects are said to be very good, even despite the curtailing of operations in oil fields for which the company supplies much rubber and metal goods. One of the newest products is a unique coupling for rotary hose used in oil well drilling.

**E. M. Smith Co.,** Los Angeles, Calif., has lately made many additions to its mechanical equipment, one of the larger items being another belt press, 30 feet long by 5 feet wide. Belting, hose, brake lining and various mechanicals are the principal products. The concern last month introduced a new specialty developed at the factory, a rubber 'free circulation" protector for oil-drilling pipes and casings, and said by Secretary W. G. Smith to be finding wide sale.

**Durable Mat Co.,** manufacturer of rubber safety mats, 2926 16th Ave., S. W., Seattle, Wash., is steadily increasing its production facilities. Its Canadian business is cared for by a branch factory in Victoria, B. C., and the eastern trade is looked after by a branch factory at 765 Miami St., Akron, O., in charge of Falcon Joslin, who formerly was active in the management of the original plant in Seattle. The officers are: president, C. L. Morris; vice president, H. W. Bell; secretary-treasurer, C. T. Lyons.

**Goodyear Rubber Co.,** 539 Mission St., San Francisco, Calif., one of the oldest on the Coast, has as its treasurer David Wright, and secretary, Mary T. Kevlin. Howard C. Lieb is factory superintendent. A separate concern, but affiliated with it for many years, is the Goodyear Rubber Co., 500 Raleigh St., Portland, Ore. The officers of the latter corporation are: President, L. C. Garrigus; treasurer, E. J. Morton; and secretary, C. E. Mace.

**Pacific Goodrich Rubber Co.,** Los Angeles, Calif., finished in February in the latter city the last of a series of salesmen's conferences held in the five major centers of distribution in the eleven farwestern states, namely, Denver, Seattle, San Francisco, Salt Lake City, and Los Angeles. An extensive promotion program was outlined and several novel methods of sales-making were determined for 1930. According to General Sales Manager Frank E. Titus, tire and tube production are being steadily stepped up in accord with a marked improvement in demand, and he regards the general trade outlook as decidely encouraging. The Yokohama, Japan, Goodrich factory, which resumed the making of tires on January 1, is rapidly getting into a position to take care wholly of demand in that part of the foreign field.

**Dill Mfg. Co.,** Cleveland, O., maker of air-pressure devices, regarding the steady growth of the southwest metropolis as a tire manufacturing center, has established an office and warehouse at 1621 S. Hill St., Los Angeles, Calif., to serve factories in that section and tire and tube dealers throughout the eleven states in the coast field.

**Samson Tire & Rubber Corp.,** Los Angeles, Calif., has finished the installation of mechanical equipment at its huge new factory on Telegraph Road, and is rapidly catching up at the new works with the big accumulation of orders. The only unfinished section of the new concern is the administration building, but it is expected that this will be completed early in May and arrangements then made for a formal opening of the entire works. In addition to manufacturing its own notable brand of tires, the Samson Corp. supplies a great quantity of high grade tires to merchandising concerns having nation-wide distribution, not including, however, the Sears, Roebuck Co., as was inadvertently stated.

**Mason Tire Co.,** Kent, O., has arranged with the Ceazan Tire Co., Los Angeles, Calif., for sole distribution by the latter of Mason products in the Pacific Coast field. The turn-over is said to involve about $2,000,000 yearly.

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## State Aids Tire Users

A road machine equipped with electromagnets and operated by the State of New Mexico recently picked up 1,695 pounds of nails and other metallic tire-puncturing articles in a single day in the streets of one city.

# CANADA

While the cotton market has forced prices of certain cotton products downward, it apparently has not yet affected mechanical rubber goods. Prices for garden hose have shown no change since the booking season closed at the end of last year. In view, however, of the cotton situation, manufacturers are watching the price movement with interest.

Placing rubber goods orders commands the attention of the trade, for the new season will open in a few weeks when new quotations, of which there has been no inkling up to this time, will be out. Meantime the rubber trade appears a source of increasing dissatisfaction to retailers because of the difficulty they now encounter in determining the extent of their requirements. This did not bother them much a few years ago when rubber goods were simply rubber goods, but now the style element is so important that dealers are always puzzled when buying, thus making the rubber goods business very speculative. The early placing discount and rebates according to volume of purchases therefore are not so profitable to many retailers as formerly inasmuch as an early decision may later occasion loss due to the fickleness of fashion. The feeling is growing among retailers that early orders, while aiding manufacturers determine in advance quantities to be manufactured, are not so advantageous to retailers. In consequence they ask more consideration from manufacturers. In this connection a committee was appointed at the recent convention of the National Shoe Retailers Association held in Toronto to meet the Rubber Manufacturers' Association to improve existing conditions. The intention is to lay the matter before the Department of Trade and Commerce if no action results, it is claimed.

**C. N. Candee,** president, Gutta Percha & Rubber, Ltd., Toronto, Ont., in a recent issue of *Industrial Canada* contributed a special article, "Laboratory Research in Rubber Industry," in which he showed that the rubber industry could not have attained its present position without research.

**W. A. Eden,** president, Dominion Rubber Co., Ltd., Montreal, P. Q., has been named a member of the Dominion legislation committee of the Montreal Board of Trade.

**Marsh Butler,** representative in the Province of Ontario for the Dominion Rubber Co., Ltd., Montreal, P. Q., is celebrating his fiftieth year as a traveling salesman. In 1911 he joined the selling staff of the Toronto branch of the Dominion company.

**A. Douglas** has been elected a member of the standing committee of the Shoe Men's Club, which has been formed in Edmonton, Alta., and has the distinction, it is said, of being the only Canadian organization of its kind. Its object is to bring together the shoe men of Edmonton, connected with the various branches of the industry, so that they will become better acquainted. Mr. Douglas represents the Miner Rubber Co., Ltd., Granby, P. Q.

**Goodyear Cotton Co. of Canada, Ltd.,** St. Hyacinthe, P. Q., recently unloaded 160 carloads of machinery and other equipment for its recently completed four-story addition. The completed mills will be ready for occupation early in April, when the opening ceremonies will be performed in the presence of C. H. Carlisle, president and general manager of the parent company, the Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont., representatives of the provincial and federal governments, and other notables. When completed, the mills will have approximately 40,000 spindles and weekly will produce 17,000 pounds of finished fabric for tires and mechanical rubber goods. About 800 persons will be employed.

**J. N. L. Derome** has been appointed manager of a new branch recently opened at 381 St. Paul St., Quebec, by the Columbus Rubber Co., Montreal, Ltd. A dinner was tendered Mr. Derome by his former associates of the Independent Rubber Co., Ltd., Quebec, for whom he worked a number of years. The dinner was presided over by James Brown, Quebec manager of the Independent company, and among those present were John Myles, vice president, Gordon H. Nickel, sales manager, and J. I. Langevin, secretary-treasurer, all of the Columbus Rubber Co., Ed Michaud, of the Independent Rubber Co., Ltd., as well as numerous other employes from both organizations. A suitable presentation was made to Mr. Derome by his former associates.

**J. E. Stephenson,** manager of the Vancouver, B. C., branch of the Goodyear Tire & Rubber Co. of Canada, Ltd., presided at the eighth annual dinner of Goodyear dealers held in the Georgia Hotel, Vancouver. It was one of the most successful in the history of the firm. The guests represented all parts of the mainland of British Columbia.

**Canadian Shoe & Rubber Boot Repairing Co., Ltd.,** was recently incorporated with a capitalization of $5,000 under the provincial companies act. The firm conducts a rubber boot and shoe manufacturing and repairing business at 7207 Fraser St., Vancouver, B. C.

**Motor Show of Eastern Canada.** The attendance this year at the Montreal Show eclipsed all former exhibitions and established a record. It is estimated that over 100,000 attended. Exhibitors stated that they enjoyed a larger volume of sales than at any previous show.

**A. B. Hannay,** manager and secretary of The Rubber Association of Canada, Toronto, Ont., in a specially written article for the *Monetary Times,* Toronto, commenting on the rubber industry in Canada during 1929, says in part, "The Canadian rubber manufacturer is well able to look after Canada's rubber needs and the rubber needs of a good deal of the rest of the world. As evidence that he treats the domestic consumer fairly, there stands out the fact that the Canadian rubber manufacturer makes a slightly larger profit on his export business than on his domestic business."

**R. W. Richards,** manager of tire sales, Goodyear Tire & Rubber Co. of Canada, Ltd., New Toronto, Ont., is authority for the statement that the balloon tire is replacing others in commercial transportation, that this type of tire has shown phenomenal disregard of heat and is, therefore, suitable for all kinds of bus and truck work. He believes that the future will see great tire advancement.

**Holtite Manufacturing Co.,** Baltimore, Md., U. S. A. The Southern Canada Power Co., Ltd., Montreal, P. Q., has secured this industry for Drummondville, P. Q. This firm manufactures rubber heels and soles, and is establishing a Canadian plant, which will eventually employ 200 persons. The investment in the development for machinery, buildings, and working capital will represent approximately a quarter of a million dollars.

## Legal

### Treasury Decisions

FINGER CATCHERS. No. 10,733. Protest 351,892-G/77,708 of International Forwarding Co. (Chicago). Merchandise classified as toys at 70 per cent ad valorem under paragraph 1,414, tariff act of 1922, is claimed dutiable as manufactures of india rubber, palm leaf, or chip at 25 per cent under paragraph 1,439.

Opinion by J. Sullivan. The merchandise covered by the protest is finger catchers. On the authority of Abstract 10,191 the protest was overruled. *Treasury Decisions,* Vol. 57, No. 5, p. 32.

RAINCOATS. No. 10,739. Protest 315,-578-G of Wm. Filene's Sons Co. (Boston). Raincoats classified at 35 per cent ad valorem under paragraph 919, tariff act of 1922, are claimed dutiable at 25 per cent under paragraph 1,439 or at 20 per cent under paragraph 1,459.

Opinion by J. Tilson. On the record presented the raincoats in question were held dutiable at 25 per cent under paragraph 1,439. *Treasury Decisions,* Vol. 57, No. 5, p. 33.

BALLS. No. 10,760. Protest 388,948-G of Geo. Borgfeldt & Co. (New York). Rubber balls classified as toys at 70 per cent ad valorem under paragraph 1,414, tariff act of 1922, are claimed dutiable at 30 per cent under paragraph 1,402.

Opinion by J. Sullivan. On the record presented and in accordance with United States v. Woolworth (16 Ct. Cust. Appls. 421, T. D. 43,136) colored hollow rubber balls were held dutiable at 30 per cent under paragraph 1,402. *Treasury Decisions,* Vol. 57, No. 6, p. 28.

# Obituary

## Joseph P. Sherbondy

ON FEBRUARY 4, Joseph P. Sherbondy, father of F. G. Sherbondy, vice president and treasurer of the Biggs Boiler Works Co., Akron, O., died at his home. He was seventy-four, and had been seriously ill for three weeks.

He leaves his widow, a son, and two brothers. Funeral services were held on February 6, and interment was in Glendale Cemetery.

## Prominent Executive

FROM Providence, R. I., on January 22 flashed the sad news of the passing of the popular secretary and acting treasurer of the Davol Rubber Co., Charles

**Charles B. Bamforth**

B. Bamforth, whose demise leaves vacant in the organization and the hearts of his friends and associates a place that can never be quite fully refilled. The end came early in the morning at his home, 207 Sumter St., Providence, after a long illness. In spite of this, however, Mr. Bamforth had continued his work actively until a week previous to his death.

He was born on November 5, 1876, at Mt. Vernon, Iowa, a son of Bentley and Ann (Wood) Bamforth, natives of Yorkshire, England, who had settled in Massachusetts, but later moved to Mt. Vernon, where they remained until after the birth of their son before returning to Massachusetts. After attending the public schools at Uxbridge, Mass., and then a business college at Cleveland, O., Charles Bamforth began at an agency his quest for a means of livelihood. By chance he was offered a position, which he accepted, with the Davol Rubber Co. In 1893 he started as a stenographer and typist and was promoted through various departments until in May, 1900, he was placed in charge of the ledger "accounts receivable." In August, 1917, he became secretary and acting treasurer of the rubber company.

Mr. Bamforth was well known in the business and the fraternal life of his adopted city, having been past president of the Rhode Island Association of Credit Men and of the Kiwanis Club of Providence, treasurer of the Davol Rubber Co.'s Mutual Association, and he was also a member of the St. John's Lodge No. 1, Masons.

His widow, one son, his mother, a brother, and a sister survive him.

## Well-Known Rubber Broker

WHILE in the subway on his way to his office on February 5, John William Oliver, prominent in the crude rubber industry, was seized suddenly with a fatal heart attack and died in the Bowling Green, I. R. T. station, New York, N. Y. Mr. Oliver was a partner with L. V. Keeler in the Avia Co., Inc., 15 Moore St., New York, of which he was treasurer. His other connections in the rubber industry included the Baird Rubber Trading Co. (1908), the rubber department of Rogers Pyatt Shellac Co. (1914-15), and Oliver, Keeler & Scudder (1921). In all

**J. William Oliver**

of these firms his ability manifested itself, and he was rewarded with promotions to higher executive positions.

Mr. Oliver was born in Rahway, N. J., on July 8, 1890. He received his formal education at the New Haven grammar school, the Jersey City High School, and Eagan's Business School, Hoboken, N. J. He was a member of the Rubber Exchange of New York and the Pelham Men's Club, Pelham, N. Y.

Funeral services were conducted from his home, 1070 Washington Ave., Pelham Manor, thence to St. Catherine's Church on February 8. Mr. Oliver leaves his widow, to whom the heartfelt sympathy of his friends and associates in the trade is extended.

## Head of Ault & Wiborg

PHILANTHROPIST, civic worker, business executive—Levi Addison Ault, whose passing on February 6 at his home in Cincinnati, O., is mourned by all who ever came in contact with him. Mr. Ault, who was seventy-eight, had suffered a stroke of apoplexy last October and had been confined to his bed ever since.

He was the founder of Ault & Wiborg Co., manufacturer of printing inks and rubber colors, bought by the International Printing Ink Co. several years ago. Mr. Ault, however, was acting head of the concern for nearly fifty years.

Prominent in business and social circles in Cincinnati, he was a director of several large industrial organizations. Besides, he was creator of the Cincinnati Board of Park Commissioners and served as its president from 1908 until 1926. He was an honorary member of the Cincinnati Club, an active member of the Queen City Club, and belonged also to the Riding and Cincinnati Country Clubs.

Funeral services were held on February 8. He is survived by his widow and three grandchildren.

## A Popular Dealer in Used Rubber Machinery

ANOTHER pioneer, this time in the used rubber machinery industry, has been summoned by the Grim Reaper. To those who knew Sigmund Liebstein, the news of his death of heart disease on February 10 after a short illness is a

**Sigmund Liebstein**

severe and tragic blow. To those he left behind, the heartfelt condolences of sympathetic associates, who knew him well, are offered.

Mr. Liebstein organized the United Rubber Machinery Exchange, 317-23 Frelinghuysen Ave., Newark, N. J., of which he was president, on August 31, 1923. Under his capable guidance the firm prospered and expanded until it reached the enviable position it now enjoys, and its late president became widely known throughout the United States.

He was born in Newark fifty-eight years ago. His wife and their son, Milton J. Liebstein, survive him.

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ACCORDING TO THE YEAR BOOK OF Railroad Information published by the Committee on Public Relations of the Eastern Railroads the Class I railways of the United States purchased rubber and leather goods in the calendar year 1928 to the amount of $9,521,000.

# The Rubber Industry in Europe

## GREAT BRITAIN

### Institution of the British Rubber Industry

The Council of the Institution of the Rubber Industry held an informal dinner on February 26, 1930, at the First Avenue Hotel, High Holborn, W. C. 1, after the eighth annual general meeting, in honor of the president-elect of the Institution, Eric Macfadyen. The retiring president, the Right Hon. Lord Colwyn, P. C., L.L.D., occupied the chair at the dinner. Among those present were: Sir George Beharrell, D. S. O., deputy president of the Society of Motor Manufacturers and Traders; L. V. Kenward, chairman of the India Rubber Manufacturers Association; Col. J. Sealy Clarke, F. I. R. I., chairman of the Research Association of British Rubber Manufacturers; and Hugh C. Coles, chairman of the I. R. I. Council. Guests of the Institution were Sir Arnold Wilson and Professor Jocelyn Thorpe, C. B. E., D. S. C., F. R. S., president of the Society of Chemical Industry.

At a meeting of the London Section at the Engineers Club on February 3 the following short papers were read: "A Note on the Sun-Cracking of Vulcanized Rubber" by B. B. Evans; "Aging of Rubber Compounded with China Clay" by P. G. Packman; "An Investigation of the Viscosity of Rubber Solutions" by C. M. Blow. Percy Dunsheath was chairman.

#### Colwyn Gold Medal Award

Institution of the Rubber Industry has awarded the Colwyn Gold Medal this year for the best essay on "The Characteristics and Applications of Rubber" from a member of the Industry twenty-five years of age or under, to W. H. Stevens, son of Dr. H. P. Stevens. Several essays were submitted under nom de plumes, and the judges, of course, were unaware of the writers' identities. The presentation was made personally by Lord Colwyn at the dinner held after the eighth annual general meeting.

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### The Rubber Situation

In the February issue of the London *Rubber Age*, Cyril Baxendale gives his views on the rubber situation. He says that the present production exceeds consumption, and in consequence the price is too low to encourage planting necessary to meet the world's requirements a few years hence.

Mr. Baxendale advocates restriction, and is interested in an estate that has been restricting for the past sixteen years by leaving out of tapping an area of 25 to 33 per cent of the mature plantation, except in 1919 and 1920, when the demand was such as to tempt the firm to break its rule. He is convinced that restriction pays better in the long run; nevertheless none of the new schemes to remedy the rubber situation appeal to him.

"The abolition of Sunday tapping," he is of opinion, "would prove useless in reducing the average output for a month."

Regarding suggestions that tapping should be stopped altogether for two months, he asserts that this would seriously disorganize the tapping force on many estates. Similar difficulties would be met with if tapping were stopped during the wintering season, while there would be a danger of the tappers running over to the neighboring Malay estates. Mr. Baxendale doubts whether stocks would be reduced by about 80,000 tons if all Europeans in Ceylon, India, Malaya, and the Dutch colonies ceased tapping for two months, as is claimed by some.

#### The Only Possible Scheme

The only possible scheme of restriction, he believes, would be to reduce the acreage in tapping by an agreement between all European growers. If done gradually, the labor force would not be disorganized, and where tapping to the limit has been the rule since the spring of 1928, such a course would be to the best advantage of the trees. The best solution of the trouble, he adds, is in extending the uses of rubber. Unfortunately the valuable work of propaganda carried out by the Rubber Growers' Association is not properly supported. Thus he points out that while, for example, four pages of the Rubber Growers Association Bulletin for January are devoted to rubber in upholstery, no hint is given there or in the advertising columns as to where to obtain rubber upholstered furniture.

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### British Rubber Imports and Exports

In discussing rubber trade returns for 1929 as published by the Board of Trade Report of the Trade and Navigation of the United Kingdom, the *India Rubber Journal* calls attention to the fact that whereas the amount of rubber retained in England, that is the net imports, came to only 4,388 tons in 1928, when the reshipment trade was particularly heavy, and to 59,924 tons in 1927, the figure for 1929 was 122,764 tons. Adding the declared stocks (London and Liverpool) at the beginning of the year and deducting the amount of such stocks on December 28, 1929, the figure of 71,592 tons is arrived at, which represents the total deliveries to the home trade during 1929. This compares with 48,046 tons in 1928, as found by the same method, and 44,883 tons in 1927.

The large increase of over 23,000 tons to the United Kingdom trade is particularly striking. At the same time it is interesting to note in scanning the figures regarding reexports that the large decrease noted in 1929 as compared with the previous year, 53,758 tons against 104,697 tons, is almost entirely due to the decrease in shipments to the United States, the comparative figures being: 5,015 tons in 1929 and 49,954 tons in 1928, a difference of 44,939 tons.

#### Imports and Exports of Manufactured Goods

The effect of tire duties continues to be quite noticeable in the figures of tire imports, which show a decline in value from £2,631,985 in 1927 to £737,326 in 1928 and £440,304 in 1929. Similarly imports of inner tubes fell from £323,521 in 1927 to £144,081 in 1928 and £82,093 in 1929. On the other hand exports of tires, which had shown a slight decrease in 1928 as against 1927, the comparative figures having been £2,698,231 and £2,812,615 respectively, improved remarkably in 1929 when the total value was £3,521,603. The exports of tubes showed a similar trend, having been £580,898 in 1927, £500,753 in 1928, and £537,817 in 1929. In going over the distribution of the tire exports, it is to be noted that while the 1929 totals indicate a rise in shipments to most of the countries, except South Africa, the large gains mentioned seem to be due to increased sales to the less important markets.

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### Tires for Soft Surfaces

Mention was made in these columns last month of Knock-Kneed tires devised by Roadless Tractors, Ltd. The *India Rubber Journal* has noted considerable scepticism in the trade regarding the practicability of this tire. One authority stated that in pneumatic tires for soft surfaces a low inflation pressure is not desirable. While it was comparatively easy to design a tire permitting a vehicle to move on a soft surface, it has to be considered that the tire would also have to prove satisfactory when the road surface changed to hard or rocky ground.

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### New Rubber-Leather Material

Broadhurst & Co., Ltd., is developing a new type of material for footwear, which consists of a combination of rubber and leather with exceptional tensile strength. It is planned eventually to make this material in a variety of attractive colors and designs.

# GERMANY

## The Kleiber Process

The Kleiber synthetic rubber process is still a subject of discussion in the European press. The warning of the I. G. Farbenindustrie A. G. has received wide publicity and *Le Caoutchouc et la Gutta-Percha* publishes in its recent issue a letter of protest from Kleiber. He emphatically denies the charges of the I. G. Farbenindustrie and at the same time says that his present process is a vast improvement over that which the I. G. Farbenindustrie investigated. The January, 1930, issue of *Kunststoffe* gives some details of the patents taken out by Kleiber and Gilardi. These patents are the Swiss Patent No. 130,704, the English Patent No. 312,741, and the French Patent No. 651,824.

According to these, petroleum or its residue is submitted to the action of an oxidant (nitric acid or sodium-peroxide) in the presence of acetate of sodium. The resulting fluid is neutralized, after which the mass obtained is mixed with terpenes and distilled at over 360° C. In this way, it is claimed, the napthenes of the petroleum are converted into metaxylene or cyclohexanene and this into adipic acid.

The reaction mixture is oxidized in an autoclave at 156° C. and 6.5-7 atmosphere pressure. After standing for 12 hours, two layers form, one of which is clear and consists of octonaphthenes, while the other, a cloudy layer, consists of an aqueous emulsion of pentamethylenes. By treating the octonaphthenes with sulphur, metaxylene is obtained with formation of sulphide of hydrogen. The filtered pentamethymene layer is submitted to oxidation by means of fuming nitric acid for a sufficiently long period, and after standing for two days, it contains Cycloxane:

$$\begin{array}{l} CH_2—CH_2—CH_2 \\ \quad\quad\quad\quad\quad\quad | \\ CH_2—CH_2—CH_2 \end{array}$$

The liquid is then decanted, and washed with water until it reacts neutral. It is then boiled in an autoclave under a pressure of 5 atmospheres with a solution of caustic soda at 156° C. A dense fluid mass forms which contains adipic acid. After decanting, an opaque, dense fluid mass is obtained, which is mixed with colophony and distilled at 360° C. This gives a fluid clear as water containing isoprene which polymerizes in the presence of heat when stirred and when acetic acid or formaldehyde is added. According to the Swiss and English patents, polymerization is promoted by the addition of a catalyzer such as natural rubber, 7 per cent of which is added in the process.

## A Freak Tire

The *Gummi-Zeitung* calls attention to the suggestion of H. R. Muller, of Berlin, to combine pneumatic and elastic tires to obtain the advantages of both. Two methods are indicated: first, a pneumatic tire is mounted on the outside of a dual wheel and the elastic tire on the inside. The latter being lower, it relieves the pneumatic tire if a flat develops, and the truck can be driven to the nearest garage without delay or danger to the casing or tube. The second method is to arrange the elastic tire inside the pneumatic tire. However, this would be more difficult to produce than the usual pneumatic tire.

Commenting on these suggestions, the *Gummi-Zeitung* states that similar proposals were made by the English tire man Killen. As for the elastic tire within the pneumatic tire, the plan as presented has not been sufficiently worked out.

## The German Raincoat

The modishness and versatility of the modern raincoat is making the garment one of general utility. For the coming season, a variety of styles and fabrics appears. Silks, both natural and artificial, are popular for light-weight garments, and come in bright colors and lively designs. Plaids, bold stripes and, for the more youthful styles, dots are much favored. In woolens, plaids and tweed effects take the front rank; coats of English style fabrics with long and full-cut revers, large patch pockets, wide belts, and two rows of buttons, are much to the fore. A very attractive variation shows a large and full-cut cape attached.

An interesting novelty is a coat that can be worn on both sides, the rubberized side having a decidedly sporty character, the favored combinations being blue and light blue, black or navy and red. Other silk coats have insets on collar, cuffs, and pockets of contrasting or harmonizing silk.

## New Tariff Duties

In the Reichstag proposals have been made to changes in duties, effective from December 31, 1929. Those affecting the rubber industry are few, covering reclaim, wagon covers, and toys. Wagon covers, formerly dutiable at 90 marks per 100 kilos, will now have a duty of only 60 marks. Reclaim will be dutiable at 10 marks per 100 kilos instead of 15 marks as before. This reduction is considered necessary because increasing quantities of reclaim are being produced and used outside of Germany and that competition must be made easier for Germany. The duty on rubber toys will be increased from 20 marks per 100 kilos to 80 and 120 marks.

## Seiberling-Fulda

Negotiations between the Seiberling Rubber Co., Akron, O., U. S. A., and Gummiwerke Fulda, A. G., have progressed to the point where the new association is definitely to start operations. It is understood that the American concern is not participating financially, for the association aims solely at technical cooperation. The Fulda concern retains its full independence and also its German management. As from January, 1930, the tire selling department of the Fulda works will be separated from the rest of the business and will be turned over to an independent firm to be known as Seiberling-Fulda G. m. b. H. The management will remain in German hands.

## Veithwerke A. G.

The Veithwerke A. G. reports gross profits of 590,000 marks against 760,000 marks the previous year. From this amount are to be deducted expenses of 500,000 marks. After writing off various items the position is such that no dividend can be declared for the year. The year before, the concern reported a loss of some 126,000 marks. The firm, which is capitalized at 1.260,000 marks, looked forward to a favorable year, but expectations, which were justified by results in the beginning of the year, were frustrated by the combination of a number of firms, which rendered competition more difficult to meet. Thus prices had to be cut twice, which naturally had an adverse effect on the final result.

## New Goods

A new type of curtain hanger with draw strings consists of a stout rubber band with loops at either end and any desired number of cloth strips to which the curtain is attached. Rubber band and draw string are so arranged that the former is always more or less under tension, so that merely removing the string from a hook at one side of the curtain causes it to open and close practically automatically and noiselessly.

Novelties for the coming bathing season are already out. The Phoenix concern has added a coiled snake, which is also a swimming collar, to its family of rubber animals for water sports. Close fitting bathing caps are shown with and without chin straps. A turban model is especially popular. Colors run riot and designs are varied and attractive. Some caps have colored designs like batik work, others achieve artistic effects by contrasting plain-surfaced rubber with surfaces simulating scales. This is also found in bathing slippers and belts. In beach footwear some pretty models with braidings in contrasting colors were noted. Shoes with medium heels, more especially for walking about on the beach, share favor with the usual heelless types.

## Absorbent Tire Fabrics

Announcement has lately been made of a fabric, designated as "Patex," that has been so processed that it is absorbent to an unusual degree. The absorbency of the fabric compared with that of ordinary cotton is demonstrated by its sinking to the bottom of a glass of water while cotton continues to float. In other words, its surface tension is eliminated and it takes up water at once. On tire fabric the process works to make the rubber impregnation more thorough, so that the cords become an integral part of the entire tire.

## Rubberized Radio Loud-Speaker

A new electro-static loud-speaker utilizes a rubber diaphragm to which a metallic foil electrode is attached with a film of vegetable oil, preferably castor oil, as it neither harms rubber nor resinifies. E. Reisz, Berlin, Germany. British Patent No. 307,794, March 13, 1928.

# The Rubber Industry in the Far East

## MALAYA

### Periodical Tapping Schemes

The disappointment over the selling scheme of the Rubber Growers' Association had hardly worn off when the report came that the Dutch were busy with a new restriction plan, and now comes the cabled information that negotiations between the British and Dutch rubber growers has culminated in a proposal to stop tapping altogether during May, 1930. Since such a plan had been urged by a number of planters for some time past, this should be welcome news. However, the final decision lies with the Rubber Growers' Association and this has yet to come. Meantime new proposals for righting the industry are offered practically every day.

In spite of the weak points of stopping Sunday tapping to reduce outputs, many favor it. Quite a number of planters are advocating restriction by periodical tapping. One such system put forward in a recent issue of the *Malayan Tin and Rubber Journal* suggests that estates should continually rest one-fifth of their tapping area for six months. If European and the larger Asiatic estates could be persuaded to cooperate, a reduction of 10 per cent of their estimated crop of 500,000 tons could be effected the first year while for each of the succeeding two years the reduction would be 25,000 tons, so that in three years' time it would be possible to save the surplus of 100,000 tons which is expected to come on the market in the next few years. The advantages of such a policy, outside of the effect it would have on the market price, are that it can be put through without disorganizing the labor force, a very important point; that the entire area would have a six months' rest every 2½ years to the great benefit of the trees; and that it would reduce the height of the tapping panels so that on a ten-year bark renewal it would never be necessary to go higher than three feet up the tree. A further advantage of this method is that since the tasks will be smaller, tapping will be possible earlier in the morning, increasing the yield; so that with this and the benefit that the trees derive from resting, it is expected that after a few years the output from 80 per cent of the area tapped according to this scheme will equal that obtainable under the usual method.

#### Companies Reducing Crops

That a system of the kind just described is finding favor with planting companies, seems to be proved by the fact that the directors are advocating it. In fact, the chairman of the Majedie (Johore) Rubber Estates, Ltd., recently announced that the company has adopted the A. B. C. system of tapping, whereby a third of the area is rested for six months.

Regarding the system, this chairman said, "This system of rotational tapping has the advantage of securing a crop of between 80 and 90 per cent off the same acreage with two-thirds of the bark consumption and two-thirds of the labor, and will eventually result in higher yields and lower costs, besides safeguarding the future bark position."

Telogoredjo United Plantations, one of the largest British-owned properties in the Netherlands East Indies, will also reduce its crop. The estimated output for 1930 is 4,710,000 pounds, an increase of 306,307 pounds over 1929. Since the directors consider it uneconomical to produce rubber and sell at a price barely covering all-in cost of production, and state that not only does the financing of such a crop involve loss of interest on the capital invested, but that tapping uses up bark reserves, which may also be regarded as capital, they propose to cut production for the current year by 10 per cent. The directors further state that they have reason to think that other companies will adopt a similar policy.

It is interesting also to note that the directors of the Kuala Pertang Syndicate, in commending the action of the Telogoredjo company, agreed that in the event of a sufficient number of rubber companies deciding to adopt this policy, instructions would be given to restrict the output of Kuala Pertang Estate by 10 per cent.

### Oil from Rubber Seed

A demonstration was recently given by F. van Cant, of the Limbonggan Distillery, of his plant for the chemical extraction of oil from rubber seed. As is known, oils are obtained from nuts and seeds either by expression with heavy hydraulic machinery or extraction with suitable solvents. Apart from the fact that the former method requires expensive machinery, much manual labor and great power consumption, from 8 to 15 per cent of oil remains in the residue, the press cakes. While this cake is fed to cattle as a rule, the cakes from rubber seed are unsuitable for feeding, and the large amount of oil left seems to have an injurious effect when the cakes are used as fertilizer. All these undesirable factors are absent when chemical extraction is used.

The plant that Mr. van Cant has invented extracts oil from any kind of seed and also from copra. By his method the seeds are first reduced to a powder in a crushing machine; the powder then undergoes a steam process. The oil extracted at first smells of the solvent used, but after deodorization it is odorless and a bright golden color. It is claimed that from 98-99 per cent of the oil present in the seeds can be extracted by the van Cant method.

## CEYLON

### Heneratgoda Rubber

Very interesting figures regarding the yields of rubber trees at Heneratgoda have been supplied by the assistant curator of the Heneratgoda Botanic Gardens. One hundred of the highest yielders have been selected, and these include 5 that were planted in 1877 and 50 that were planted in 1886, 20 in 1897, and 25 in 1910, that is 5 are over 50 years old and 50 are more than 40 years old. The best yielder of them all is the well-known Heneratgoda No. 2, which gave 49 pounds and 2 ounces of rubber in biscuit form and 1 pound 12 ounces of scrap in the year April, 1927, to March 1928. Owing to heavier rainfall all the trees gave reduced outputs during the year 1928-1929, the yields from No. 2 totaling 31 pounds 2¼ ounces of biscuit and 3 pounds 6½ ounces of scrap in that year.

Another high yielder planted in the same year (1877) is No. 24, which in the same periods gave 44 pounds 3 ounces biscuit and 4 pounds 14 ounces of scrap against 28 pounds biscuit and 3 pounds 1¼ ounces scrap. No. 400, planted in 1886, yielded 43 pounds 12¾ ounces of biscuit and 1 pound 7½ ounces of scrap in 1927-1928 and 34 pounds 1½ ounces biscuit and 2 pounds 11¾ ounces scrap in 1928-1929. Other trees from which 30 pounds and over of biscuit were obtained in 1927-1928 are Nos. 401, 445, 440, 439, 411, all planted in 1886, and Nos. 82 and 75 planted in 1897.

The best trees of those planted in 1910 gave less than 20 pounds of biscuit in a year. All the trees here mentioned and three planted in 1910 have been selected for testing on the Iriyagama Division of the Peradeniya Experiment Station.

### Rejuvenation Experiments

A problem of growing importance is to find the most economical method of restoring old planted areas which are no longer profitable to exploit in the regular manner.

At the Peradeniya Experiment Station an experiment was started in August, 1929, to test the possibility and economy of rejuvenating old rubber and at the same time to throw some light on the most economical method of tapping to death.

An area of 3 acres will be divided into four plots which will be tapped to death in one, two, three, and four years by the following systems:

Plot 1. Tapped daily on two half-spiral cuts at an angle of 22° with 2 inches of bark consumed per month, the bottom cut starting at 12 inches and the top one at 50 inches. To be tapped for one year.

Plot 2. Similar to No. 1, but with 1⅔ inches of bark consumption per month and the first cut opened about 24 inches. To be tapped two years.

Plot 3. Same as Plot 2, but with 1½-inch bark consumption per month. To be tapped three years.

Plot 4. This will be tapped with two cuts alternating monthly with 1⅔ inches bark consumption per month. To be tapped four years. All cuts on the first panel will be to the wood, but tapping on the second panels on the other side of the tree will be normal.

After tapping to death, it is intended to fell, stump, and take out lateral roots on each plot, to manure with 3 cwt. phosphate and 1 cwt. sulphate of ammonia, and sow thickly either *Crotalaria* or *Tephrosia Candida* in order to obtain organic matter before planting. Then silt pits and soil erosion ridges will be put in and *Centrosema pubescens* or *Eupatorium triplinerve* will be planted on the ridges only. Holes 15 feet by 15 feet will be made during the north east monsoon, and holes will be filled with top soil and green manure. Budded stumps of Dutch East Indian, Malayan, and Ceylon clones will then be planted, different clones on different diagonals. After test tappings have shown the best clones, the trees will be thinned out to about 90 trees per acre.

## New Hevea Disease

A disease of young shoots of bud-grafted rubber has recently been studied and reported on by R. K. S. Murray, mycologist, Rubber Research Scheme, Ceylon. Specimens of the diseased green shoots were received almost simultaneously from two different estates in the Kalutara district. In both cases the shoot had evidently been attacked about three inches from the tip, and when the specimens were received, the disease was manifested as a sunken discolored area about six inches long on one side of the shoot. Investigations showed the cause of the disease to be *Phytophthora* though it has not been possible as yet to identify the fungus with any of the previously described tropical species of *Phytophthora* and it seems to differ from the species which causes secondary leaf fall and other diseases of *Hevea*.

# NETHERLANDS EAST INDIES

## New Restriction Plans

That the Dutch rubber growers are determined to evolve some means for bolstering up rubber prices and earnestly desire the cooperation of British and other rubber growers, is evident from the fact that they have lost no time in formulating a new scheme to take the place of those which they and the Rubber Growers' Association put forward. About the middle of January they suggested the restriction of plantation and native output by 10 to 20 per cent by proportionate prohibition of tapping. This was to be enforced by a pool in which each plantation owner would pay 20 guilders per ton and each native grower 2 cents per kilogram produced. In case of infringement of restriction, this money was to be forfeited and handed to some charitable institution. Professor Treub, ex-minister of finance and chairman of the Proprietors' Association for the Dutch East Indies, was the prime mover of this plan.

At a meeting held a few days later at The Hague, it was decided to create a joint British and Dutch committee to study further the rubber problem. Professor Treub presided, and the following British representatives were present: W. H. Daukes, R. N. G. Bingley, and A. L. Mathewson. They represent a committee appointed by the Rubber Growers' Association to consider Dutch proposals. The committee consists of 60 members who between them hold about 500 directorships.

On February 7 the British and Dutch Liaison Committee met in London and discussed important proposals, though what these were could not be learned at the time. Eric Miller is on this joint committee.

### Proposal to Stop May Output

According to a cable from Amsterdam, dated February 19, a meeting of Dutch, French, Belgian, Swiss, and German rubber producers was held on that day to discuss the decision reached by the British and the Dutch at the London meeting of February 7. The decision reached is completely to stop production of rubber during the month of May this year. The proposal was passed almost unanimously, the owners of only 2,000 tons out of the 51,000 tons represented opposing the move.

From the outset it has been known that the Rubber Growers' Association would only support restriction or other proposals from the joint committee if at least 70 per cent of the Dutch growers joined the scheme. It now remains to be seen what the outcome of all this will be.

## Phythophthora Infects Hevea

It is an odd coincidence that about the same time when Ceylon is troubled by *Phythophthora* attacking buddings, similar reports should come from Java. In *De Bergcultures*, Johannes Gandrup states that during the recent rainy period he received specimens of shoots from buddings that had died from *Phythophthora*. That leaves and young green branches of old trees in Besoeki could be infected by this fungus was known, but the attack on buddings appears to be new.

The first indication of the disease is a small black spot on the green stalk. In more advanced cases they are found in all sizes, generally long, the color shading into brown on the edges with dull spots in the center. The lenticels of the surrounding green bark appear as swollen yellow spots. In advanced cases the leaves have a sickly color and as the disease progresses, the whole tip of the stalk discolors; the leaves wither and fall off.

It seems that the number of buddings attacked was not inconsiderable. When the dry weather came, the disease stopped as is usual with *Phythophthora*.

Gandrup suggests that the fungus is present in the soil and the spores are carried by raindrops spattering against the trees.

The conditions for the growth of the fungus are more favorable on young buddings than on young seedlings. It is quite possible that the large number of buddings which at first shoot properly and then suddenly die have largely been affected by *Phythophthora*.

## Department of Agriculture, Industry, and Commerce

As a token of esteem and gratitude for what the Department of Agriculture, Industry, and Commerce has done for European cultures, a special number of *De Bergcultures* has been issued on the occasion of the completion of the twenty-fifth year of the department's existence.

The Department of Agriculture was established on January 1, 1905 (a division for Industry and Commerce was not added until 1911), as a result of the efforts of the then-director of the Government Botanical Gardens, Prof. Melchior Treub, who was the first director of the department. The development of scientific rubber cultivation is largely due to the work carried out by the experts connected with the department before the era of the rubber experiment station. This is especially true of Western Java, where more independent research work was not really started until 1914, when H. J. Lovink, then director of the Department of Agriculture, and J. G. H. de Voogt, chairman of the Rubber Exhibition of 1914, presented a rubber testing installation to a specially formed society, Centraal Rubberstation, to improve and test rubber. Later, the Centraal Rubberstation was able to erect its own building where its usefulness found wider scope.

Experiment stations in other parts of Java have the Department of Agriculture to thank for their existence. The importance of the work carried out by experts of the department itself can best be understood when it is remembered that it was here that the first serious rubber disease—stripe canker—was studied and a method of controlling the disease was discovered, and that the pioneer work in connection with bud grafting of *Hevea* was undertaken by Cramer and van Helten.

# Rubber Patents, Trade Marks and Designs

## Machinery

### United States

1,742,473.* Battery Box Mold. This relates to one-piece battery boxes in which partitions are formed to define cell spaces into which packs of storage battery plates are placed. R. Holtz, Cincinnati, assignor to Richardson Co., Lockland, both in O.

1,743,059.* Fabric Cutter. This has particular relation to that part of a bias cutter which operates to insure accurate measurement and cutting of relatively wide strips as well as narrow ones. H. M. Brown, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,743,070.* Heel Blank Cutter. This displaces hand methods by providing a machine for cutting heel blanks of substantially uniform volume from slabs of sheet material. L. Wetmore, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,743,077.* Inserting Airbags. This is a method for contracting pneumatic air cores to permit their application to pneumatic tire casings. E. F. Maas, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,743,302.* Feed Control of Calenders. This comprises a pair of rolls in combination with the calender rolls by which the rubber is sheeted and continuously cut into strips. These strips then pass as the feed into the calender. A. Allen, Winchester, assignor to Atlantic Precision Instrument Co., Boston, both in Mass.

1,744,130.* Extruding Tubes. This die box for a tubing machine is chambered to allow thorough mastication of the stock after passing the radial mandrel supporting arms, thus eliminating the lines of weakness usually caused by the radial arms. C. S. McChesney, Kenmore, and H. H. Clark, assignors to Dunlop Tire & Rubber Corp., both of Buffalo, all in N. Y.

1,744,224.* Tread Cutter. This measures and cuts tire treads from continuous lengths of material. The speed is adjustable while in operation to keep the machine in time with the production of the material being cut into lengths. A. C. Hirsch and A. R. Krause, assignors to Gillette Rubber Co., all of Eau Claire, Wis.

1,744,339.* Vulcanizing Press. This is a press for vulcanizing tubes, tires, and similar articles which are inflated by pressure. The mold structure is provided with steel lining members. F. H. Smith, Philadelphia, Pa.

1,744,438.* Molding Inner Tubes. By this invention transfers can be applied for imprinting the size and the brand on the outside surface of the tube. F. J. Benson, assignor to Fisk Rubber Co., both of Chicopee Falls, Mass.

1,741,443. Strand and Brake Lining Device. E. Slade, New York, N. Y.

1,741,634. Stock Measurer and Cutter. A. R. Krause, assignor to Gillette Rubber Co., both of Eau Claire, Wis.

1,741,635. Stock Measurer and Cutter. A. R. Krause and A. C. Hirsch, assignors to Gillette Rubber Co., all of Eau Claire, Wis.

1,741,797. Grooving Tool. H. D. Stevens, assignor to Firestone Tire & Rubber Co., both of Akron, O.

1,741,801. Tire Tool. C. J. White, St. Ignace, Mich.

1,742,736. Roll Grinder. H. E. P. Taylor, Seymour, assignor, by mesne assignments, to Farrel-Birmingham Co., Inc., Ansonia, both in Conn.

1,742,777. Incorporating Cords in Sheets. T. Midgley, Hampden, assignor to Fisk Rubber Co., Chicopee Falls, both in Mass.

1,743,066. Collapsible Chuck. E. G. Templeton, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,743,125. Grooving Device. G. W. Fleming, assignor to Fleming Machine Co., both of Worcester, Mass.

1,743,299. Cutter. K. Wiemer, assignor to F. B. Lehmann, both of Dresden, Germany.

1,743,780. Tennis-Ball Canning Device. L. R. Hurlburt, Flushing, N. Y., assignor to Pennsylvania Rubber Co., Jeannette, Pa.

1,743,825. Electric Cable Tool. R. M. Martens, West Roxbury, Mass.

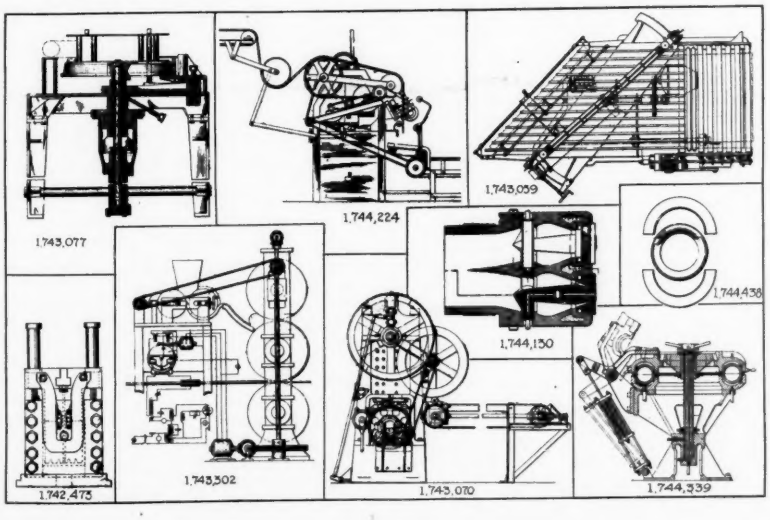
1,743,826. Milling Insulated Wire Tool. R. M. Martens, West Roxbury, Mass.

1,744,089. Ball Mill. F. O. Williamson, Alameda, Calif.

1,744,431. Tire Balancer. H. C. Wood, assignor to Fisk Rubber Co., both of Chicopee Falls, Mass.

1,744,484. Core Handling Device. T. Midgley, Hampden, assignor to Fisk Rubber Co., Chicopee Falls, both in Mass.

* Pictured in group illustration.




### Dominion of Canada

296,081. Matrix for Mosaics. S. H. Boynton, Los Angeles, Calif., U. S. A.

296,270. Air Tire Spreader. C. E. Branick, Fargo, N. D., U. S. A.

296,329. Footwear Press Cure Mold. H. McGhee, Rushcutters Bay, near Sydney, N. S. W., Australia.

296,437. Squeegee Guider. Goodyear Tire & Rubber Co., assignee of R. S. Kirk, both of Akron, O., U. S. A.

296,438. Band-Building Machine. Goodyear Tire & Rubber Co., assignee of E. F. Maas, both of Akron, O., U. S. A.

296,661. Mold Manipulating Device. Dunlop Rubber Co., Ltd., London, N. W. 1, assignee of H. Willshaw and S. N. Goodhall, both of Birmingham, all in England.

296,863. Rubber Article Form. Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of A. W. Keen, Hasbrouck Heights, N. J., U. S. A.

### United Kingdom

321,009. Boot Mold. H., A., and G. Steppé, all of Berchem-Ste. Agathe, Brussels, Belgium.

321,476. Fabric Covering Device. Firestone Tire & Rubber Co. (1922), Ltd., London. (Firestone Tire & Rubber Co., Akron, O., U. S. A.)

321,546. Sole-Laying Press. Compo Shoe Machinery Corp., New Brunswick, N. J., and W. H. Bresnahan, Swampscott, Mass., both in the U. S. A.

### Germany

488,962. Calender. Harburger Eisen-und Bronzewerke A. G., Harburg b. Hamburg.

490,057. Filling Air Tubes. Niederrheinische Eisenhütte und Maschinefabrik A. G., Dulken, Rhld.

490,303. Hydraulic Button Press. Niederrheinische Maschinenfabrik Becker & van Hullen, A. G., Krefeld.

490,665. SPREADER. A. Boecler, St. Mandé, France. Represented by J. Fritze, Hamburg, and C. Stoepel, Berlin S. W. 11.

### Designs

1,099,890. CALENDER. Continental Gummi-Werke A. G., Hannover.

1,099,913. HEEL REPAIR MOLD. W. Hasselbach, Berlin W. 8.

1,100,235. HEEL MOLD. Firma C. A. Hefter, Berlin-Charlottenburg.

1,101,793. SOLE MOLD. H. Schild, Leipzig N. 24.

1,101,986. TIRE VULCANIZER. Berlin-Rixdorfer Gummiwaren-Fabrik Hans Schumann, Berlin N. 65, and Roman von Krencki, Berlin-Halensee.

### France

664,490. RESOLING PRESS. L. Furelaud.

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## Process

### United States

1,741,208. FORMING DRUM TIRES. W. E. Swern, Kokomo, Ind.

1,741,491. PRESSURE HOSE. G. A. Ansell, assignor to Dunlop Tire & Rubber Goods Co., Ltd., both of Toronto, Ont., Canada.

1,741,530. ELASTICIZED FABRIC. J. Mayer, Belle Harbor, assignor to Comfolastic Corp., New York, both in N. Y.

1,741,997. MARKING TIRES. W. G. Lerch, Akron, assignor to India Tire & Rubber Co., Mogadore, both in O.

1,742,398. FLEXIBLE DIAPHRAGM. C. S. Kelley, E. McKeesport, assignor to Westinghouse Air Brake Co., Wilmerding, both in Pa.

1,742,625. SEALING INSULATING PARTS. F. Weckerle, assignor to Studiengesellschaft fuer Wirtschaft u. Industrie m. b. H., both of Munich, Germany.

1,742,866. FOOTWEAR. T. Kurata, Kurume-Shi, Japan.

1,742,885. RUBBER PRINTING DIE. H. R. Wade and L. M. Harley, assignors to Jas. H. Matthews & Co., all of Pittsburgh, Pa.

1,743,425. INFLATABLE BALLS. M. Carter, Los Angeles, Calif.

1,744,025. TIRE. V. C. Anderson, Seattle, Wash.

1,744,438. MOLDING INNER TUBES. F. J. Benson, assignor to Fisk Rubber Co., both of Chicopee Falls, Mass.

### Dominion of Canada

296,414. SHOE SOLE. Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of T. B. Huestis, Bristol, R. I., U. S. A.

296,415. APPLYING EMBOSSED SURFACE. Dominion Rubber Co., Ltd., Montreal, P. Q., assignee of R. P. Rose, Jackson Heights, N. Y., U. S. A.

296,435. PNEUMATIC TIRE CASING. Goodyear Tire & Rubber Co., assignee of R. D. Evans, both of Akron, O., U. S. A.

### United Kingdom

321,564. FISHING LINE CORD. F. D. Smith, Berkshire.

321,586. ARTIFICIAL TEETH. F. W. Barbour, Toronto, Ont., Canada.

321,714. TIRE CASING. Firestone Tire & Rubber Co. (1922), Ltd., London. (Firestone Tire & Rubber Co., Akron, O., U. S. A.)

### France

663,657. IMPROVED TIRE PROCESS. C. Veber.

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## Chemical

### United States

17,541. (Reissue). WATERPROOFING COMPOSITION. A. F. Owen, Jackson Heights, N. Y., assignor to Naugatuck Chemical Co., Naugatuck, Conn.

1,741,778. ANTIAGER. Tetraphenyl hydrazine. P. C. Jones, Cuyahoga Falls, O., assignor to B. F. Goodrich Co., New York, N. Y.

1,742,609. TREATING RUBBER. Improvement of flexing value. J. McGavack, Jackson Heights, N. Y., assignor to Naugatuck Chemical Co., Naugatuck, Conn.

1,742,650. CONSTRUCTIONAL MATERIAL. A. C. Fischer, Chicago, Ill., assignor to Philip Carey Mfg. Co., a corporation of O.

1,742,651. ROAD EXPANSION JOINT. A. C. Fischer, Chicago, Ill., assignor to Philip Carey Mfg. Co., a corporation of O.

1,742,757. DYEING RUBBER. E. G. Croakman, Akron, O., assignor to National Aniline & Chemical Co., Inc., New York, N. Y.

1,743,243. ACCELERATOR. W. Scott, assignor to Rubber Service Laboratories Co., both of Akron, O.

1,743,433. RUBBER COMPOUNDING. A. B. Cowdery, Needham, Mass., assignor to Barrett Co., a corporation of N. J.

1,744,469. ELECTROPAINT. L. J. D. Healy, Milwaukee, Wis., assignor to Fisk Rubber Co., Chicopee Falls, Mass.

1,744,602. OIL-PROOF RUBBER COMPOSITION. E. Yoshioka, Ochiai-Machi, Toyotama-Gori, Tokyo-Fu, Japan.

### Dominion of Canada

296,096. GOLF BALL COATING. W. C. Geer, New Rochelle, N. Y., U. S. A.

296,179. INSULATING ELECTRICAL CONDUCTORS. I. G. Farbenindustrie A. G., Frankfort-on-Main, assignee of O. Schmidt, Ludwigshafen-on-Rhine, both in Germany.

296,350. RUBBER MOLD WASH. A. Voshage, Hannover, Germany.

296,364. LATEX COMPOSITION. American Can Co., New York, N. Y., assignee of J. E. Robinson, Glen Ellyn, Ill., both in the U. S. A.

296,434. ANTIOXIDANT. Goodyear Tire & Rubber Co., assignee of A. M. Clifford, both of Akron, O., U. S. A.

296,436. UNITING RUBBER TO METAL. Goodyear Tire & Rubber Co., assignee of L. B. Sebrell, both of Akron, O., U. S. A.

296,468. ELECTRICAL INSULATION. Simplex Wire & Cable Co., Boston, assignee of C. R. Boggs, Waban, and J. I. Blake, Boston, all in Mass., U. S. A.

296,868. COMPOSITION. I. G. Farbenindustrie A. G., Frankfort-on-Main, assignee of E. Konrad and W. Siefken, Köln-Mulheim, all in Germany.

### United Kingdom

320,699. ACCELERATOR. J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfort-on-Main, Germany.)

320,960. SYNTHETIC RUBBER. J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfort-on-Main, Germany.)

321,220. ROLL COMPOSITION. G. Spencer, Moulton & Co., Ltd., Westminster, and S. S. Pickles, Wiltshire.

321,258. COMPOSITION. J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfort-on-Main, Germany.)

321,398. AQUEOUS DISPERSIONS COATING. Dunlop Rubber Co., Ltd., London, D. F. Twiss and E. A. Murphy, both of Birmingham.

321,404. PUNCTURE SEALING COMPOSITION. A. Bryce and A. J. Evans, both of London.

321,558. PRINTING INK BASIS. L. C. Neale, Flemington, Victoria, Australia.

321,689 to 321,692 inclusive. FACTICE. L. Auer, Budapest, Hungary.

321,693 and 321,694. FACTICE. P. Stamberger and L. Auer, both of Budapest, Hungary.

321,699. FACTICE. L. Auer, Budapest, Hungary, and N. Strachovsky, London.

321,704 and 321,705. COMPOSITIONS. L. Mellersh-Jackson, London. (American Glue Co., Boston, Mass., U. S. A.)

321,710. CABLE INSULATION. W. E. Beatty, London. (Bell Telephone Laboratories, Inc., New York, N. Y., U. S. A.)

321,722 to 321,726 inclusive. FACTICE. L. Auer, Budapest, Hungary.

321,830. CABLE INSULATION. J. McCallum, Glasgow, Scotland.

321,850. RUBBER MOLD PREVENTATIVE. J. Y. Johnson, London. (I. G. Farbenindustrie A. G., Frankfort-on-Main, Germany.)

### Germany

489,868. ARTICLES FROM LATEX. Veedip, Ltd., Brentford, Middlesex, England. Represented by B. Kugelmann, Berlin S. W. 11.

489,968. CONVERSION PRODUCTS. B. F. Goodrich Co., New York, N. Y., U. S. A. Represented by G. Benjamin, Berlin-Charlottenburg.

489,969. ARTIFICIAL PRODUCTS. L. Lilienfeld, Vienna, Austria. Represented by W. Schmitzdorff, Berlin S. W. 61.

490,257. ARTIFICIAL MASSES. Kunstharzfabrik Fritz Pollak, Vienna, Austria, and O. Neusz, Kirschenalle, 1B., Berlin-Charlottenburg. Represented by D. Landenberger, Berlin S. W. 61.

### France

664,183. PREPARING PURE RUBBER. Societe Aktiebolaget Separator.

664,419. PRODUCING RUBBER. I. G. Farbenindustrie A. G.

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## General

### United States

1,741,198. INFLATED-TIRE RELEASE VALVE C. B. McKenna, New York, N. Y.

1,741,351. TEXTILE MACHINERY ROLL. W. A. Tebo, Anthony, R. I., assignor to Draper Corp., Hopedale, Mass.

1,741,434. ADVERTISING DEVICE. L. E. Pratt, Nutley, N. J., and H. L. Sloan, Brooklyn, assignors to Pratt & Florea, Inc., New York, both in N. Y.

1,741,441. TIRE CUSHION FRAME. W. J. Sheirs, Brooklyn, N. Y.

1,741,783. Sponge Cup. M. S. Lower, assignor to Sun Rubber Co., both of Barberton, O.

1,741,805. Separable Fastener. C. H. Baker, assignor to Firestone Footwear Co., both of Hudson, Mass.

1,742,107. Tire Valve. J. A. Stubblefield, Bay City, assignor of one half to A. E. Myers, Condon, both in Oreg.

1,742,176. Sponge Rubber Shoe. H. C. Hebig, Roselle Park, N. J., assignor of 55 per cent to N. Littell, New Canaan, Conn.

1,742,283. Packing Unit. S. M. Sager, Chicago, Ill., assignor to Sager Pen Corp., a corporation of Del.

1,742,288. Bottle Filling Machine. P. W. Shields, assignor to McKenna Brass & Mfg. Co., both of Pittsburgh, Pa.

1,742,368. Buoyant Swimming Suit. F. M. Nunez, San Francisco, Calif.

1,742,488. Conductor Insulator Shield. E. J. Schneider, Jamaica, and M. B. Bradt, assignors to Eastern Tube & Tool Co., Inc., both of Brooklyn, all in N. Y.

1,742,548. Moistener. J. H. Leal, Los Angeles, Calif.

1,742,740. Tire Pressure Gage. A. Watters, Chicago, Ill.

1,742,748. Splash Shield. A. Angell, Milwaukee, Wis.

1,742,778. Nipple. T. W. Miller, assignor to Faultless Rubber Co., both of Ashland, O.

1,742,995. Hairdressers' Apron. M. D. Laverdiere, Rochester, N. H.

1,743,074. Vehicle Wheel Windshield. C. H. Roth, assignor to Goodyear Tire & Rubber Co., both of Akron, O.

1,743,119. Shock-Insulator Drawbar. R. F. Cowell, Teaneck, N. J., assignor to International Motor Co., New York, N. Y.

1,743,244. Ice Bag. R. Shulman, Brooklyn, N. Y.

1,743,400. Sink Pad. M. Rust, Erie, Pa.

1,743,492. Coupling Pin. H. E. Sipe, New York, N. Y.

1,743,493. Knob. H. E. Sipe, New York, N. Y.

1,743,612. Motor Mounting. R. K. Lee, assignor to Chrysler Corp., both of Detroit, Mich.

1,743,676. Sole. H. T. Mason, assignor to Quabaug Rubber Co., both of North Brookfield, Mass.

1,743,688. Cushion Tire. A. L. Schoff. Caldwell, N. J., and F. H. Meyer, Warren, O., said Meyer assignor to American Welding & Mfg. Co., Warren, O., and said Schoff assignor to Overman Cushion Tire Co., Inc., New York, N. Y.

1,743,694. Article Holder. W. Tierney, assignor of 10 per cent to C. Hanley, both of Butte, Mont.

1,743,937. Swab. H. R. Standlee, assignor of one-fourth to Paul Arbon Co., both of Tulsa, Okla.

1,744,009. Resilient Engine Support. G. E. Parker, Birmingham, assignor to General Motors Corp., Detroit, both in Mich.

1,744,087. Pump. E. A. Watts, Springfield, O.

1,744,338. Tire Valve. A. B. Shaw, assignor, by direct and mesne assignments, to D. M., D. E., and E. M. Storey, all of Santa Monica, Calif., and S. E. Knapp and J. G. Whittemore, trustees.

1,744,408. Automobile Bumper Guard. W. J. Millard, assignor of one half to A. Wolf, both of New York, N. Y.

1,744,423. Facial Ice Packer. E. W. Toadvine, Los Angeles, Calif.

1,744,491. Flush Tank Valve. G. B. Mullen, Bayside, N. Y.

1,744,496. Tub Cover. F. Partenico, Culver City, assignor, by direct and mesne assignments, to Noomalin Products, Inc., Los Angeles, both in Calif.

1,744,590. Pressure Gage. E. A. Sutherland, Caribou, Me.

## Dominion of Canada

296,091. Window Frame Glazing Channel. A. E. Dutfield, London, England.

296,142. Pneumatic Tire. E. R. Woods, Portland, Ore., U. S. A.

296,210. Abrasive Wheel. Geo. W. Perks Co., assignee of J. R. Gammeter, both of Akron, O., U. S. A.

296,340. Footwear Tread Member. G. S. Shaw, New Brighton, England.

296,368. Hermetic Seal. Anchor Cap & Closure Corp., Long Island City, assignee of A. Podel, New York, both in N. Y., U. S. A.

296,372. Sole. Beacon Falls Rubber Shoe Co., assignee of W. B. Hopwood, both of Beacon Falls, Conn., U. S. A.

296,439. Cable Bead. Goodyear Tire & Rubber Co., assignee of H. R. Teegarden, both of Akron, O., U. S. A.

296,559. Infants' Sanitary Apron. J. H. Hoover, Woodland, Calif., U. S. A.

296,575. Cement Culvert Device. T. Nose, Kamakura Machi, Kamakura Gun, Kanagawa Ken, Japan.

296,583. Filter Fabric. S. C. Smith, London, E. C. 2, England.

296,825. Horseshoe Anti-Slipping Device. P. P. Snyder, Detroit, Mich., U. S. A.

296,865. Motor Mounting Pad. Duffy Mfg. Co., assignee of J. F. Duffy, both of Holland, Mich., U. S. A.

## United Kingdom

320,594. Flexible Coupling. Garrard Engineering & Mfg. Co., Ltd., and H. V. Slade, both of Swindon.

320,616. Loom. British Thomson-Houston Co., Ltd., London, R. J. Chapman, Rugby, and H. W. H. Warren, Coventry.

320,633. Pneumatic Chamber. Dunlop Rubber Co., Ltd., London, W. H. Paull, F. Fellowes, and F. A. Nicholas, all of Fort Dunlop, Birmingham.

320,650. Tire. A. V. Mellano, Surrey.

320,657. Paving Block. E. O. Cowper, London.

320,685. Rubber-Lined Pipe. N. Swindin and Nordac, Ltd., Middlesex.

320,734. Shoe Pad. A. H. Gosden, Sussex.

320,744. Valve. Campbell, Achnach & Co., Ltd., J. Gillan, and T. Garstang, all of Glasgow, Scotland.

320,803. Road-Vehicle Signal. Westwood Rim & Patents, Ltd., Birmingham, and H. B. Westwood, Grimes Hill, near Birmingham.

320,807. Universal Joint. Hardy Spicer & Co., Ltd., Birmingham. (Soc. Anon. Etablissements Brampton, Calais, France.)

320,815. Footwear. W. A. Williams and North British Rubber Co., Ltd., both of Edinburgh.

320,907. Percussive Drill. H. S. Potter, Johannesburg, South Africa.

320,920. Ground Nut Sheller. E. E. Bentall and G. C. Bingham, both of Essex.

320,934. Packing Ring. G. Spencer, Moulton & Co., Ltd., R. T. Glascodine, and C. W. C. Hine, all of Westminster.

320,970. Tire Inflater. D. C. Campbell, Glasgow, Scotland.

320,981. Gramophone Pick-Up. S. G. Brown, London.

321,002. Motor Vehicle. D. Brown, Newcastle-on-Tyne.

321,015. Pipe Joint. G. B. Brader, London.

321,060. Horseshoe Pad. H. E. C. Carter, Yorkshire.

321,090. Bath Fitting. A. L. Wiggin, Staffordshire.

321,144. Gramophone Pick-Up. P. D. Tyers. Hertfordshire.

321,167. Resilient Wheel. A. J. Johnsen, Durban, South Africa.

321,189. Uniting Transparent Sheets. C. H. Field, London, and D. Haslett, Surrey.

321,199. Phonograph Diaphragm. J. D. Thompson, Guernsey, Channel Islands.

321,217. Leather Treating Machine. Turner Tanning Machinery Co., Ltd., Bramley, near Leeds. (Turner Tanning Machinery Co., Peabody, Mass., U. S. A.)

321,274. Propeller Shaft Packing. W. J. Yarwood & Sons, Ltd., and W. D. Yarwood, both of Northwich.

321,512. Seat Covering. J. E. Horn, New York, N. Y., U. S. A.

321,606. Athletic Boot. R. M. Dobbie, Ayr, and J. A. Dobbie, Airdrie, both of Lanarkshire.

321,861. Pneumatic Tire. K. Arnold, Nuremberg, Germany.

## Germany

489,090. Ball Pessary. P. Bakaleinikow, Leningrad, Russia. Represented by E. Wesnigk, Berlin S. W. 61.

489,097. Furniture Upholstery. Sorbo Rubber Sponge Products, Ltd., Woking, England. Represented by S. Goldberg, Berlin S. W. 61.

489,926. Inflatable Articles. S. Saul, Aachen.

490,106. Paving Block. Universal Rubber Paviors, Ltd., Manchester, England. Represented by B. Kugelmann, Berlin S. W. 11.

490,705. Elastic Webbing. W. J. Teufel, Stuttgart.

### Designs

1,099,892. Carriage Door. Linke-Hofmann-Busch-Werke A. G., Berlin N. W. 6.

1,099,908. Heel Guard. H. Birkenfeld, Dortmund.

1,100,191. Printing Roller. Continental Gummi-Werke A. G., Hannover.

1,100,287. Mud-Guard for Tires. W. Hoffmann, Berlin S. W. 68.

1,100,301. Tubeless Tire. J. Seybold, M.-Gladbach.

1,100,332. Block Belt. Pahl'sche Gummi- und Asbest G. m. b. H., Dusseldorf-Rath.

1,100,561. Mop Closing. C. Morcinek, Breslau.

1,100,736. Special Felloe. A. Fröhlich, Hannover.

1,100,752. SAFETY RING FOR TIRES. A. Fröhlich, Hannover.

1,100,858. RING SHAPED DISK. Pahl'sche Gummi-und Asbest G. m. b. H., Dusseldorf-Rath.

1,100,895. PRINTING ROLLER. Zieger & Wiegand, A. G., Leipzig-Volkmarsdorf.

1,101,011. TIRE FABRIC REENFORCEMENT. Gummiwerke Fulda, A. G., Fulda.

1,101,280. WASHBOARD. E. Trankner, Leipzig W. 33.

1,101,488. BATHING CAP. Harburger Gummiwarenfabrik Phoenix A. G., Harburg-Wilhelmsburg 1.

1,101,568. BALATA BELT. H. Kruger, Muhlhausen i. Th.

1,101,624. TEETHING RING. J. Bruhl & Co., Breslau 1.

1,101,737. RUBBERIZED FABRIC. Hanseatische Gummiwerke G. m. b. H., Hamburg 27.

1,101,998. WIRE INSERT FOR TIRES. Voltohm. Seil-und Kabel-Werke A. G., Frankfurt a. M.

1,102,027. LEGGING. M. Muller, Muhlau.

1,102,251. SOLE AND HEEL. A. Marchlewicz, Berlin-Steglitz.

1,102,340. SANITARY GARMENT. M. Schlesinger, Claussnitz, Bez., Leipzig.

1,102,457. PAD. C. Kaufmann, Dortmund.

### France

664,624. ANTISKID SOLE. A. Caussonel.

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## Trade Marks

### United States

265,510. Circle containing representation of half the sun and its rays and above these, the word: "SUNRUCO." Table, floor, and telephone-base pads, and mats, all of rubber or rubber in combination with other materials. Sun Rubber Co., Barberton, O.

265,540. Circle with partly lined border, containing representation of a man before a tree. Buffing and draw springs and bearing blocks. George Spencer, Moulton & Co., Ltd., London, England.

265,596. EMERALD CORD. Hose wholly or partly of rubber. Goodyear Tire & Rubber Co., Akron, O.

265,601. HOLD-TITE. Adhesive liquid rubber coating for undersurface of carpets, etc., to prevent slipping. Hold-Tite Products Co., San Francisco, Calif.

265,618. ARTISTIC SHOE CO., INC. Footwear of fabric and leather, fabric and rubber, and leather and rubber. Artistic Shoe Co., Inc., Brooklyn, N. Y.

265,628. MATCHLESS. Belting and hose of rubber or rubber and fabric. United States Rubber Co., New York, N. Y.

265,650. THE SPIRIT OF ST. LOUIS. Golf balls. Des Rosiers Patents Co., Providence, R. I.

265,702. THOROBRED. Garden hose. Boston Woven Hose & Rubber Co., Cambridge, Mass.

265,709. BELNORD. Tires and tubes therefor of rubber and rubber fabric. Pep Boys—Manny, Moe & Jack, doing business as Belnord Tire & Rubber Co., Philadelphia, Pa.

265,733. Representation of players on a football field and below, the word: "SCRIMMAGE." Footwear of leather, rubber, fabric, and/or combinations thereof. Endicott Johnson Corp., Endicott, N. Y.

265,735. Dotted outline of a shoe containing representation of a woodland camp scene and the words: "AMERICAN HIKER." Sneakers. Endicott Johnson Corp., Endicott, N. Y.

265,752. LAND-O-LAKES. Footwear wholly or partly of leather, rubber, canvas, or textile material. Woodbury Shoe Mfg. Co., Derry, N. H.

265,753. ARCH-EN-TINE. Footwear wholly or partly of leather, rubber, canvas, or textile material. Woodbury Shoe Mfg. Co., Derry, N. H.

265,758. VIDI. Footwear of leather, rubber, or fabric, or combinations thereof. D'Angelo-Bauer Corp., New York, N. Y.

265,767. MARLEN. Shoes of leather, canvas, rubber, and combinations thereof. W. T. Grant Co., Lynn, Mass., and New York, N. Y.

265,774. SUNRUCO. Stool cushions, chair pads, and chair-leg guards. Sun Rubber Co., Barberton, O.

265,807. Lined sign containing the words: "FIRESTONE SUPREME." Storage batteries. Firestone Tire & Rubber Co., Akron, O.

265,808. FIRESTONE. Storage batteries. Firestone Tire & Rubber Co., Akron, O.

265,822. Shield containing the letter: "F." Storage batteries. Firestone Tire & Rubber Co., Akron, O.

265,848. Rectangle with a fancy border, containing the words: "THE GARLOCK PACKING CO. QUALITY CONTROLLED GARLOCK 234 MECHANICAL PACKING," and two small rectangles, one containing the word: "FORM," the other, the words: "SIZE, NET WEIGHT, LBS., OZS." Packing and packing material wholly of or from various combinations of asbestos, rubber, cotton, flax, copper, lead, iron, and babbitt. Garlock Packing Co., Palmyra, N. Y.

265,849. Rectangle, with fancy border composed chiefly of a square in each corner containing representation of a quadrant compass and a rule, a label containing the words: "TRADE MARK GARLOCK REG. U. S. PAT. OFF., M. DE F. R.," and a rectangle containing the words: "THE STANDARD PACKING OF THE WORLD"; containing the words: "THE GARLOCK PACKING CO. QUALITY CONTROLLED MECHANICAL PACKING GARLOCK 377. FORM. SIZE. NET WEIGHT, LBS., OZS.," representation of a rule across a quadrant compass, in the space between, a diamond containing the words: "TRADE MARK GARLOCK," and below the rule the words: "REG. U. S. PAT. OFF. M. DE F. R." Packing and packing material wholly of or from various combinations of asbestos, rubber, cotton, flax, copper, lead, iron, and babbitt. Garlock Packing Co., Palmyra, N. Y.

265,983. Circle containing the words: "B R FINE TOOLS." Rubber-working machines. Black Rock Mfg. Co., Bridgeport, Conn.

266,003. DOUBLE SERVICE. Tires and tubes. Mansfield Tire & Rubber Co., Mansfield, O.

266,006. RUSSET. Inner tubes. Dayton Rubber Mfg. Co., Dayton, O.

266,158. Silhouette of head of warrior with plumed helmet. Combs. Vulcanized Rubber Co., Inc., Portland, Me.

266,159. LETH-O-GRANE. Waterproofs. Quickslip Co., Inc., New York, N. Y.

266,187. Representation of a smiling boy in sleeping garment, holding a tire on his right and a lighted candle in his left hand. Rubber solvents. Fisk Rubber Co., Chicopee Falls, Mass., and Cudahy, Wis.

266,188. Representation of the Fisk Boy before a sign containing the word: "FISK." Rubber solvents. Fisk Rubber Co., Chicopee Falls, Mass., and Cudahy, Wis.

266,189. FEDERAL. Rubber solvents. Federal Rubber Co., Chicago, Ill., Cudahy, Wis., and Chicopee Falls, Mass.

266,239. CODE OFFICIAL BALL. Rubber and composition balls. W. E. Code, Chicago, Ill.

266,353. Pattée cross containing the word: "LEY," horizontally and vertically. Golf balls. Niblett-Jeffries Corp., New York, N. Y.

266,464. NUVO. Baby pants and hose supporters. I. B. Kleinert Rubber Co., New York, N. Y.

266,466. SKOOTS. Boots and shoes of or containing rubber and/or canvas. Converse Rubber Co., Malden, Mass.

266,467. SKYLARK. Rubber and composition soles and heels. Essex Rubber Co., Inc., Trenton, N. J.

### Dominion of Canada

48,240. Representation of an animated tire and an animated coin, each having a human face, arms, and legs, and running hand in hand, the coin having also a dollar sign stamped thereon, and contains as its base a solid horizontal rectangular strip bearing the words: "WE MAKE YOUR DOLLAR GO FARTHER," and at its upper left background, a shield bearing the words: "THE LONGEST RUN FOR YOUR MONEY." Tires and tubes. Canadian Tire Corp., Ltd., Toronto, Ont.

48,263. SHURLITE. Goods wholly or partly of rubber, rubber compositions, or rubber substitutes. Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont.

48,278. SPORT. Golf balls. Dunlop Tire & Rubber Goods Co., Ltd., Toronto, Ont.

48,333. STAYFAST. Rubber cushions for billiard and pool tables, etc. Eastern Billiard Table Co., Montreal, P. Q.

### United Kingdom

495,549. AVON. Golf balls. Avon India Rubber Co., Ltd., London, N.W. 1.

496,681. AVON. Rubber soles and heels for boots and shoes and rubber sheeting for their manufacture and repair. Avon India Rubber Co., Ltd., London, N.W.1.

498,047. DUROGLOSS. Material in sheet form in which rubber predominates and articles made therefrom included in Class 40. J. C. Haartz, New Haven, Conn., U. S. A.

498,940. Triangular bow in which the following letters and words are inscribed in Russian: "C. C. C. P. MOCKABA," meaning "U. S. S. R. Moscow"; directly under the bow is a black circle around which the following letters are located: "B. C. H. X.," meaning "S. C. N. E." (Supreme Council of National Economy); under the above signs the name of the trust is inscribed in Russian: "PE3NHOTPECT," which means "RESINOTREST." Footwear, socks, and stockings (not for surgical or curative purposes), all of rubber. Gosudarstvenni Trust Resinovoi Promishlennosti "Resinotrust," Moscow, Russia.

499,978. CHAD VALLEY. Stationery, including adhesive tape, date indicators and stamps, erasers, and rubber bands. Chad Valley Co., Ltd., Harborne, Birmingham.

503,892. SYREX. Tire inflators. Syrex Pumps & Accessories, Ltd., High Holborn, London, W. C. 1.

504,880. FLEX. Carbon black for compounding with rubber, pigments, and colors. Thermatomic Carbon Co., Pittsburgh, Pa., U. S. A.

505,381. CASCO. Bumpers of metal and rubber. British Safety Devices, Ltd., Glasgow, Scotland.

505,428. Representation of zigzag lightning and in one corner an arrow through the word: "HOOD." Boots and shoes wholly or partly of rubber. Hood Rubber Co., Watertown, Mass., U. S. A.

505,481. NOMARCH. Soles and heels. Panther Rubber Co., Ltd., Sherbrooke, P. Q., Canada.

505,665. THALOSSA. Bathing shoes, caps, etc. Louis Becker, Ltd., London, W. 1.

506,471. ENFLAYTEX. Tennis balls. Sir J. W. Paton, Kensington, London, S. W. 7.

506,629. RUBBERSAN. Imitation sponges of rubber. Rubbersan Products, Inc., New York, N. Y., U. S. A.

507,178. JACKAL. Engine packings and jointings. Beldam Packing & Rubber Co., Ltd., London, E.C.3.

507,342. STERENEMA. All goods in Class 40. Leyland & Birmingham Rubber Co., Ltd., Leyland, Lancashire.

507,344. NU-LEDA. All goods in Class 40. Leyland & Birmingham Rubber Co., Ltd., Leyland, Lancashire.

507,507. SPIRACOL. Erasers. Koh-I-Noor Pencil Factory, Budweis, Czechoslovakia.

508,229. ORPIC. Footwear. Charles H. Baber, Ltd., London, W. 1.

508,230. APTERNA. Footwear. Charles H. Baber, Ltd., London, W. 1.

508,258. ANTELOPE. Engine packings and jointings. Beldam Packing & Rubber Co., Ltd., London, E. C. 3.

## Designs

### United States

80,001. COMBINED SOLE AND HEEL. Term 7 years. H. H. Wydom, Boston, assignor to Hood Rubber Co., Watertown, both in Mass.

80,093. WEBBING FOR SUSPENDERS, GARTERS, ETC. Term 3½ years. A. Sheldon, assignor to Russell Mfg. Co., both of Middletown, Conn.

80,206. TIRE. Term 14 years. J. W. Walker, assignor to Marshall-Wells Co., both of Duluth, Minn.

80,227. TIRE. Term 7 years. H. C. Hower, Chicago, Ill.

80,230. TIRE. Term 7 years. R. W. Hutchens, assignor to Gillette Rubber Co., both of Eau Claire, Wis.

80,361. SOLE. W. E. Crowley, assignor to Lambertville Rubber Co., Inc., both of Lambertville, N. J.

### Dominion of Canada

8,560. TIRE. Dominion Rubber Co., Ltd., Montreal, P. Q.

## Prints

### United States

12,248. PUSHING A GOOD THING ALONG. Tires. R. Goodwin, Los Angeles, Calif.

12,323. PALS IN PLAY. Toy balloons. Oak Rubber Co., Ravenna, O.

## Labels

### United States

36,686. PACIFIC PRINCE GOLF BALLS. Golf balls. Pacific Golf Ball, Ltd., San Francisco, Calif.

36,687. PACIFIC GOLF BALLS. Pacific Golf Ball, Ltd., San Francisco, Calif.

36,859. CARNIVAL. Rubber-stamp sets for children. Superior Type Co., Chicago, Ill.

## Durium

Durium is a new synthetic resin transformed by heat from a liquid to an insoluble, infusible, flexible solid. It was perfected by Dr. H. T. Beans, of Columbia University, New York, N. Y., who describes this new composition as "liquid in its original form which is transformed by heat into an insoluble, infusible solid which combines hardness and flexibility."

A thin film of durium will not crack or chip under hammering, yet is almost as flexible as paper. It will withstand the temperatures of molten lead or type metal without change, and at excessively high temperatures oxidizes without melting.

The chief difference between durium and other synthetic resins is that it hardens quickly, making it possible to utilize stamping instead of molding processes which consume more time.

## TIRES ON SIX-WHEEL VEHICLES

TIRES are a very important consideration in both motorcoach and truck operations. Operating costs may be considerably affected by the cost of tires per mile, and the difference between a satisfactory and an unsatisfactory operation may often depend upon the continuity of tire service. It is therefore fitting to point out the relative effect of six-wheel and four-wheel designs on tires.

Many factors may affect tire mileage, but only those will be mentioned which may be varied according to whether the vehicle is a six-wheeler or a four-wheeler. The following are the principal factors of this character, which have been observed in actual service: (1) Load per tire: normal load, abnormal load: car-track driving, crown of road, uneven inflation, one tire flat; (2) braking; (3) alinement; (4) mechanical conditions.

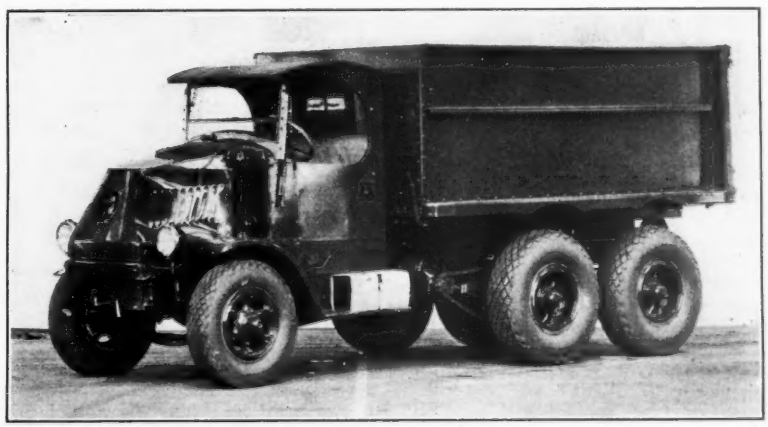
With the same kind of service and road conditions, no other single factor has greater effect on tire wear than the load carried. Tire mileage drops off very rapidly as the load increases over the rated carrying capacity for tires of any given size.

In the early days of the six-wheelers, their weight per pound of useful load was considerably less than that of a four-wheeler of approximately equal carrying capacity. Impact tests by the United States Bureau of Public Roads in 1925 showed that the weight per pound of capacity load for four-wheelers was 1.23 pounds against 0.64 pound for six-wheel trucks.

With this large difference in weight per pound of capacity load, a considerably lower tire cost per pound of useful load was to be expected and was actually secured with the six-wheel vehicle.

The author after studying the 10 points on which the tire performance of four-wheel and six-wheel vehicles should be judged, concludes that six-wheelers should give as good tire mileage as four-wheelers and that certain design changes can be made to improve the performance of tires on six-wheelers.

There is room, within the legal width-limit, for larger tires on a six-wheeler. Flat tires can be detected more easily with single than with dual tires, but dual tires reduce road delays resulting from punctures. Single right rear wheels of six-wheelers are subject to a large number of punctures. G. M. Sprowls, in *S. A. E. Bulletin*, Dec., 1929.



A Six-Wheel Mack Truck

## A Novel Heel Grip For Rubber Boots

THE hitherto inevitable movement up and down at the heel experienced when walking in rubber boots can be eliminated by a simple device built into the boot at the time of its manufacture. This invention has much practical importance from the point of view of economy and the comfort of the wearer, for the slipping mentioned produces chafing that not only wears out socks but produces blisters.

The picture, representing a stockinged foot in a cut-away boot, shows the location of the heel grip and the way it holds the heel socket of the boot in contact with the heel of the wearer.

The heel grip holds the boot to the foot so well that contact of the footwear

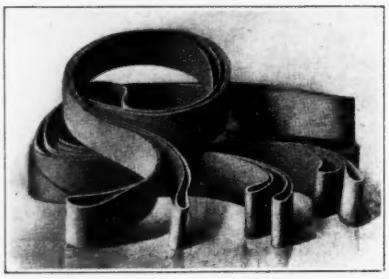
**Sponge Rubber Heel Grip**

over the instep is unnecessary under all ordinary conditions of walking. Thus there may be an air space surrounding most of the foot, which will contribute to better ventilation of the boot. The resiliency of the pads prevents any disagreeable pressure against the foot and at the same time allows them to conform to the shape of any wearer's heel. It was designed by C. R. Snow of Ketchikan, Alaska.

## Polishing Belts

AS a means for cleaning and polishing castings and other small metal products, polishing belts running at high speeds are used. These may be of woven white cotton or of duck and rubber, made endless. In the latter case light-weight closely woven high quality duck is friction coated on both sides with rubber. Thus prepared, it is then cut to desired ply widths and built up in endless form by winding one continuous piece of duck. This insures a belt that is uniformly strong and flexible at every point. The plies will not separate, and the belt runs smoothly because of uniform thickness throughout. This type of belt is stiffer and harder than an all-cotton belt and will give extremely good service under very severe conditions.

In any adhesive belt the cutting material is secured to the belt surface by glue as the adhesive medium. Excessive heat and cold or dampness tend to impair glue;



**Endless Duck Polishing Belts**

therefore it is important to exercise proper care in the storage of abrasive belts. They should be kept in a warm, but not hot, dry place, free from grit or dust and should be tested before use by being allowed to run idle on the machine for a few moments when first applied.

## Accidents in Rubber Plants

At the last Annual Safety Congress held in Chicago, Ill., E. W. Beck[1] presented a paper on "A Survey of Accident Rates" in which he stressed the fact that in 1928 the rubber industry ranked fourth among seventeen industries in accident severity rate, or in other words 1.26 days were lost from accidents per 1,000 man-hours worked. Of the industries listed those that showed less loss of time on this basis were: textile, 0.66 days; power press, 1.04 days; automotive, 1.06 days.

The table of accident frequency rates by industries for 1928 places the rubber industry seventh in the list as regards the number of lost-time accidents per million man-hours worked. On this basis the highest frequency rate was in mining, 67.8 accidents compared with 28.3 for the rubber industry; construction, 59.4 days; refrigeration, 46.6 days; woodworking 45.6 days; packing and tanners, 42.3 days; and quarry, 39.6 days.

Mr. Beck pointed out that rubber is not the hazardous industry that it once was regarded when men were required to pay an extra insurance premium for working in it. It should be noted that the adoption of automatic machinery is chiefly responsible for the greater safety operations in any line of industry. Formerly there was mutual absence in rubber working of automatic machines and process control. This condition is passing and bringing safety to operators. The introduction of conveyer systems and elimination of hand trucks, elevators, etc., for moving goods, lasts, molds, etc., rank as an important feature in increasing safety in the rubber industry.

[1]Supervisor of Safety, United States Rubber Co., New York, N. Y.

### Parazone

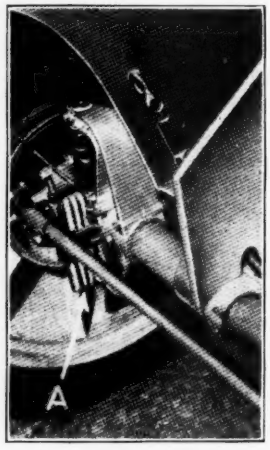
Parazone is a new and strictly non-discoloring antioxidant which is especially recommended for white sidewalls of tires and other white or delicately tinted rubber stocks that may be exposed to sunlight.

## Rubber Cord Suspension For Martin Automobiles

THE airplane-type rubber suspension here illustrated as applied to the wheel of a Martin baby automobile is indicated by A in the picture. This tiny car, promised within the next year, has no chassis. Its body frame serves as the support for the suspension for the front and rear ends. There are no springs; the wheels are suspended by means of rubber shock absorber cords such as are usually employed in certain types of airplane wheels.

It is claimed that these shock absorbers will function perfectly for 25,000 miles of operation and that they can be replaced quickly and easily at very low cost by any person.

The picture shows the detail of the




**Rubber Cord Shock Absorber**

shock-absorber cord mounting. The wheel spindle rides on a vertical shaft enclosed in a leather dust protector. The entire weight of the car rests on the rubber cord, being suspended from the wheel spindle. The effectiveness of this rubber suspension is indicated by the fact that the little car of only 60 inches wheel base equipped with this suspension can be driven over a rough plowed field with absolute absence of the racking rebound that would be experienced under the same conditions with a car suspended by ordinary springs. Martin Motor Truck Corp., Garden City, L. I., N. Y.

## Firestone Battery Shop in Southwest

Firestone storage batteries will in the near future be built in Los Angeles as well as in Akron. Vice President and General Manager R. J. Cope of the Firestone Tire & Rubber Co. of California, when queried about a report to that effect, admitted that the parent company is planning for the erection of a battery factory adjoining the big tire plant in the southwest city, but is not ready to state when it will be started. The output will be distributed in the eleven far west states.

# MARKET REVIEWS

## CRUDE RUBBER

### New York Exchange

CRUDE rubber prices sagged during the last week of January to losses of ½-cent by February 4, when all positions closed at the low quotations for the month. February alone broke through the 15-cent level, but within the next three weeks gains of nearly 1½ cents were made in all the forward months.

Stocks of rubber in London have continued to increase, amounting to more than 60,000 tons. The Rubber Manufacturers Association reports rubber on hand in the United States, January 31, at 120,649 tons compared to 105,138 tons December 31, and 76,342 for January, 1929.

The Henderson Reports give the consumption for last year at 465,153 tons compared to 437,000 tons for 1928, and state that rubber consumed last December amounting to 23,298 tons was the smallest for any month since June, 1924. The figures in the Rubber Manufacturers Association estimate for rubber consumed in January are 36,669 tons, against 42,530 tons for the month a year ago.

While December production of automobiles in the United States fell to 119,950, compared to 233,135 for that month in 1928, the total domestic output for motor vehicles in 1929 amounted to 5,358,361 against 4,357,384 in 1928.

Concerning tire production, P. W. Litchfield, president of The Goodyear Tire & Rubber Co., is quoted: "There will be no reduction in wage scales, and while the sale of tires used as original equipment on motor cars will fall off during 1930 from last year, it will compare favorably with any previous year excepting the record year of 1929. With the two-year cycle before new cars come into the market for tire renewals, this year should get the benefit of the large business done by the motor car manufacturers during 1928."

The *Journal of Commerce:* "An even more direct, yet normal and continuing influence on rubber consumption is the constantly growing use and increased registration of automobiles throughout the world. This increase is far more rapid than the rates of increase in population or even of general prosperity, and will continue to be so for many years."

The rubber market for the week ended February 1 moved in a small range. Advices that a British-owned estate had announced its decision to curtail production by 10 per cent during 1930 and its belief that other estates would do likewise, caused some uneasiness among the shorts, and induced freer buying to cover.

**RUBBER EXCHANGE ACTIVITIES**

| Week Ended | Contracts Sold: Transactions, Number | Contracts Sold: Tons | Transferable Notices | Week-End Tone |
|---|---|---|---|---|
| Feb. 1 | 1,307 | 3,267.5 | 80 | Quiet |
| Feb. 8 | 1,771 | 4,427.5 | 0 | Strong |
| Feb. 15 | 1,216 | 3,040.0 | 10 | Quiet, steady |
| Feb. 21 | 3,223 | 8,057.5 | 4 | Firm |
| Total | 7,517 | 18,792.5 | 94 | |

**PRICES FOR WEEK ENDED FEBRUARY 1:**

| Position | High | Low | Close | Previous Week's Close |
|---|---|---|---|---|
| Feb. | 15.30 | 14.90 | 14.90 | 15.10 |
| Mar. | 15.50 | 15.30 | 15.40 | 15.30 |
| Apr. | 15.70 | 15.40 | 15.40 | 15.50 |
| June | 16.10 | 15.80 | 15.80 | 15.90 |
| Aug. | 16.50 | 16.30 | 16.30 | 16.30 |
| Oct. | 16.80 | 16.70 | 16.80 | 16.70 |
| Dec. | 17.20 | 17.00 | 17.10 | 16.90 |

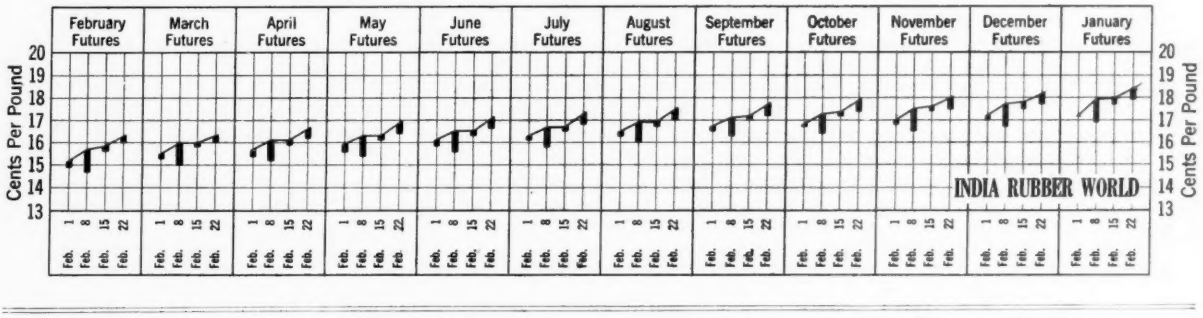
During the second week, ended February 8, the market was more active with a recovery of a cent a pound at the close from the low prices reached on Tuesday.

The *Journal of Commerce* reads, "The complexion of things in crude rubber underwent a marked change. The commodity was higher in all markets; activity expanded in futures; and manufacturers grew more aggressive in the actuals."

Symington & Sinclair declare, "During the past fortnight American manufacturers bought large quantities in London and the Far East, together with some buying for British, Continental, and Russian accounts."

The Rubber Exchange concerning restriction says, "The committee of British and Dutch growers appointed recently to inquire into the possibilities of joint action on restriction has reached an agreement, and will submit its findings to the respective organizations of the two industries;" and the *Journal of Commerce* states, "The trade has an unconfirmed report from London that the restriction committee favors suspension of tapping one week out of each month, provided London spot prices do not average 9 pence or better. Subscribed to by both the Dutch and British

### New York Rubber Exchange Clearing House Prices—High and Low Weekly Changes on "A" Contracts for Monthly Futures




### The Rubber Exchange of New York, Inc.

**DAILY MARKET FUTURES—RIBBED SMOKED SHEETS—CLEARING HOUSE PRICES—CENTS PER POUND—"A" CONTRACTS**

| Positions 1930 | January, 1930: 27 | 28 | 29 | 30 | 31 | February, 1930: 1 | 3 | 4 | 5 | 6 | 7 | 8 | 10 | 11 | 12* | 13 | 14 | 15 | 17 | 18 | 19 | 20 | 21 | 22* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| January | 15.2 | 15.0 | 15.2 | 15.1 | 15.1 | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... | .... |
| February | 15.2 | 14.9 | 15.1 | 15.1 | 15.0 | 14.9 | 14.8 | 14.7 | 15.0 | 15.4 | 15.2 | 15.7 | 15.6 | 15.8 | .... | 15.7 | 15.7 | 15.7 | 16.0 | 16.1 | 16.2 | 16.0 | 16.3 | .... |
| March | 15.5 | 15.3 | 15.5 | 15.4 | 15.4 | 15.3 | 15.1 | 15.0 | 15.2 | 15.5 | 15.5 | 16.0 | 15.8 | 16.0 | .... | 15.9 | 15.9 | 15.9 | 16.0 | 16.3 | 16.3 | 16.1 | 16.3 | .... |
| April | 15.7 | 15.5 | 15.6 | 15.6 | 15.5 | 15.4 | 15.3 | 15.2 | 15.4 | 15.7 | 15.6 | 16.1 | 15.9 | 16.1 | .... | 16.1 | 16.1 | 16.0 | 16.2 | 16.5 | 16.5 | 16.3 | 16.6 | .... |
| May | 15.9 | 15.7 | 15.8 | 15.8 | 15.7 | 15.6 | 15.5 | 15.4 | 15.6 | 15.9 | 15.8 | 16.3 | 16.1 | 16.3 | .... | 16.3 | 16.3 | 16.2 | 16.4 | 16.7 | 16.8 | 16.5 | 16.9 | .... |
| June | 16.1 | 15.9 | 16.0 | 16.0 | 15.9 | 15.8 | 15.6 | 15.6 | 15.8 | 16.1 | 16.0 | 16.5 | 16.3 | 16.5 | .... | 16.5 | 16.5 | 16.4 | 16.6 | 16.9 | 17.0 | 16.7 | 17.1 | .... |
| July | 16.3 | 16.1 | 16.3 | 16.2 | 16.1 | 16.1 | 15.9 | 15.8 | 16.0 | 16.3 | 16.3 | 16.7 | 16.5 | 16.7 | .... | 16.7 | 16.7 | 16.7 | 16.8 | 17.1 | 17.2 | 17.0 | 17.3 | .... |
| August | 16.5 | 16.3 | 16.4 | 16.4 | 16.3 | 16.3 | 16.1 | 16.0 | 16.2 | 16.5 | 16.4 | 16.9 | 16.7 | 16.9 | .... | 16.9 | 16.9 | 16.9 | 17.0 | 17.2 | 17.3 | 17.1 | 17.5 | .... |
| September | 16.7 | 16.5 | 16.6 | 16.6 | 16.5 | 16.5 | 16.3 | 16.3 | 16.5 | 16.7 | 16.6 | 17.1 | 17.0 | 17.2 | .... | 17.1 | 17.1 | 17.1 | 17.2 | 17.4 | 17.5 | 17.3 | 17.7 | .... |
| October | 16.8 | 16.7 | 16.8 | 16.8 | 16.7 | 16.7 | 16.4 | 16.4 | 16.6 | 16.9 | 16.8 | 17.3 | 17.2 | 17.4 | .... | 17.3 | 17.3 | 17.3 | 17.4 | 17.6 | 17.6 | 17.5 | 17.9 | .... |
| November | 17.0 | 16.9 | 17.0 | 17.0 | 16.8 | 16.8 | 16.5 | 16.6 | 16.8 | 17.0 | 16.9 | 17.5 | 17.4 | 17.6 | .... | 17.4 | 17.4 | 17.4 | 17.5 | 17.7 | 17.8 | 17.6 | 18.0 | .... |
| December | 17.2 | 17.0 | 17.2 | 17.2 | 17.0 | 17.0 | 16.7 | 16.8 | 16.9 | 17.2 | 17.1 | 17.7 | 17.6 | 17.8 | .... | 17.6 | 17.5 | 17.5 | 17.7 | 17.9 | 18.0 | 17.8 | 18.2 | .... |
| 1931 January | .... | .... | .... | .... | .... | 17.2 | 16.9 | 17.0 | 17.1 | 17.4 | 17.3 | 17.9 | 17.8 | 18.0 | .... | 17.8 | 17.7 | 17.7 | 17.9 | 18.1 | 18.2 | 18.0 | 18.4 | .... |

*Holiday.

growers, this would mean a reduction of 25 per cent monthly."

**PRICES FOR WEEK ENDED FEBRUARY 8:**

| Position | High | Low | Close | Previous Week's Close |
|---|---|---|---|---|
| Feb. | 15.80 | 14.70 | 15.80 | 14.90 |
| Mar. | 16.00 | 15.00 | 16.00 | 15.40 |
| Apr. | 16.10 | 15.20 | 16.10 | 15.40 |
| June | 16.50 | 15.60 | 16.50 | 15.80 |
| Aug. | 16.90 | 16.00 | 16.90 | 16.30 |
| Oct. | 17.40 | 16.40 | 17.40 | 16.80 |
| Dec. | 17.80 | 16.80 | 17.80 | 17.10 |

Lamborn, Hutchings & Co.: "London advices reported that the directors of seventeen Shanghai companies operating rubber plantations have decided to restrict their 1930 output by 10 per cent, this being a further indication of the trend toward curtailment of the recent overproduction. Such developments would indicate, it seems, that the excess of the commodity for the last year or more should be about at an end. However, it must be granted that with heavy stock in the principal world markets, sufficient for probably five or six months' consumption requirements, it will take time, particularly with a somewhat smaller consumption in this country likely this year, for the present unbalanced supply and demand situation to come more in line, and to materially affect prices."

Rubber futures swung within a range of 20 to 30 points, through the third week, ended February 15, and closed about midway in the narrow movement. Firmer foreign markets with reports of additional attempts to secure curtailment in production contributed to the steadiness of the market tone. Although there is no great faith in any effective cooperation between the British and Dutch to the end of restricting the production of rubber, the trade is favorable towards present prices of rubber and shows a disposition to await developments in the Far East.

**PRICES FOR WEEK ENDED FEBRUARY 15:**

| Position | High | Low | Close | Previous Week's Close |
|---|---|---|---|---|
| Feb. | 15.80 | 15.70 | 15.70 | 15.80 |
| Mar. | 16.00 | 15.90 | 15.90 | 16.00 |
| Apr. | 16.10 | 15.90 | 16.00 | 16.10 |
| June | 16.50 | 16.30 | 16.40 | 16.50 |
| Aug. | 16.90 | 16.70 | 16.90 | 16.90 |
| Oct. | 17.40 | 17.20 | 17.30 | 17.40 |
| Dec. | 17.80 | 17.50 | 17.50 | 17.80 |

Somewhat higher prices and more active trading were features of the rubber market during the last week. It begins to appear more likely that some constructive scheme will develop from the Anglo-Dutch conferences.

H. Hentz & Co. says, "Suggestions have been made to eliminate tapping during the month of May, and if that step does not have sufficient effect on the market, tapping should also be stopped during another month to be decided upon later in the year. Eastern cable advices suggest that medium-sized Asiatic estates are thoroughly sympathetic to some such action being taken. We estimate that elimination of tapping in May by the larger estates would withhold, conservatively, some 30,000 tons of rubber from the market."

The New York Rubber Exchange reports a cable from Amsterdam reading: "At a meeting of Dutch, French, Belgian, Swiss, and German rubber producers called to discuss a means of putting into effect the decision reached by the Anglo-Dutch Rubber Growers Committee in London on February 7, the proposal to stop production of rubber completely during the month of May, this year, was adopted almost unanimously."

The Department of Commerce reports the production of motor vehicles in the United States for January at 273,089 as compared with 120,004 for December, and 401,037 in January, 1929. Stocks of rubber on hand and in transit as reported by the Rubber Manufacturers Association are the largest in years.

But Lamborn, Hutchings & Co. states, "This factor is more than offset by the favorable consumption figures. No doubt these heavy stocks account for the conservative buying attitude of our manufacturers though with their daily rate of operations reported gradually on the increase, they have taken on fair weights and can be expected to continue so."

**PRICES FOR WEEK ENDED FEBRUARY 21:**

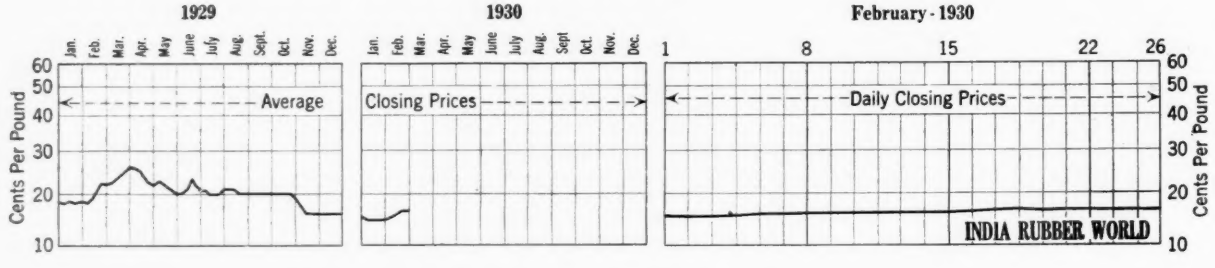
| Position | High | Low | Close | Previous Week's Close |
|---|---|---|---|---|
| Feb. | 16.20 | 16.00 | 16.00 | 15.70 |
| Mar. | 16.10 | 16.40 | 16.10 | 15.90 |
| Apr. | 16.50 | 16.20 | 16.30 | 16.00 |
| June | 17.00 | 16.60 | 16.70 | 16.40 |
| Aug. | 17.30 | 17.00 | 17.10 | 16.90 |
| Oct. | 17.80 | 17.50 | 17.50 | 17.30 |
| Dec. | 18.00 | 17.80 | 17.80 | 17.50 |

The market on February 24 was quiet and steady. Spot ribs closed at 16.40 nominal.

## New York Outside Market

One notable feature of the month was the steady gradual advance in price typified by the rise of spot ribs from 15⅛ cents on February 1 to 16½ cents on February 24. Another feature was the progressive buying interest of manufacturers. Both tendencies seem to have been influenced largely by the persistent efforts of the plantation interests to effect a workable scheme for restriction of production. That some agreement will finally result between the Dutch, English, and native growers seems increasingly probable. A London cable of February 24 reported unanimous agreement on the part of the English growers committee to the restriction plan advanced by the Dutch. The details of

### New York Outside Market—Spot Closing Prices Ribbed Smoked Sheets




### New York Outside Market—Spot Closing Rubber Prices—Cents Per Pound

| | January, 1930 | | | | | February, 1930 | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 27 | 28 | 29 | 30 | 31 | 1 | 3 | 4 | 5 | 6 | 7 | 8 | 10 | 11 | 12* | 13 | 14 | 15 | 17 | 18 | 19 | 20 | 21 | 22* |
| Ribbed smoked sheet | 15¼ | 15¼ | 15⅛ | 15⅛ | 15⅛ | 15⅛ | 15 | 15 | 15⅛ | 15½ | 15½ | 15¾ | 15¾ | 15¾ | .... | 15⅞ | 15⅞ | 15⅞ | 16 | 16¼ | 16⅜ | 16⅛ | 16⅜ | .... |
| No. 1 thin latex crepe | 15⅞ | 15¾ | 15⅞ | 15¾ | 15¾ | 15⅝ | 15⅝ | 15⅝ | 15¾ | 16 | 15⅞ | 16⅛ | 16⅛ | 16¼ | .... | 16½ | 16½ | 16½ | 16⅝ | 16¾ | 16⅞ | 16⅝ | 16⅞ | .... |
| No. 1 thick latex crepe | 15⅜ | 15¼ | 15⅜ | 15⅜ | 15⅜ | 15¼ | 15⅜ | 15⅜ | 15⅜ | 15⅝ | 15½ | 15¾ | 15⅞ | 15⅞ | .... | 16⅛ | 16 | 16⅛ | 16¼ | 16½ | 16⅝ | 16⅜ | 16⅝ | .... |
| No. 1 brown crepe | 14 | 13⅞ | 14 | 13⅞ | 13⅞ | 13⅞ | 13⅞ | 15¾ | 14 | 14¼ | 14¼ | 14½ | 14½ | 14⅞ | .... | 14¾ | 14⅞ | 14⅞ | 14¾ | 14⅞ | 15 | 14⅞ | 15⅛ | .... |
| No. 2 brown crepe | 13¾ | 13⅝ | 13⅝ | 13½ | 13⅝ | 13½ | 13⅝ | 13½ | 13¾ | 14 | 14 | 14⅛ | 14¼ | 14⅝ | .... | 14½ | 14⅝ | 14⅝ | 14½ | 14¾ | 14¾ | 14⅝ | 14¾ | .... |
| No. 2 amber | 14⅛ | 14 | 14 | 13⅞ | 13⅞ | 13⅞ | 13⅞ | 13⅞ | 14 | 14⅜ | 14⅜ | 14½ | 14⅝ | 14⅞ | .... | 14⅞ | 14⅞ | 14⅞ | 14⅞ | 15⅛ | 15⅛ | 15 | 15⅛ | .... |
| No. 3 amber | 13¾ | 13¾ | 13⅞ | 13⅝ | 13¾ | 13¾ | 13⅝ | 13⅝ | 13¾ | 14⅛ | 14⅛ | 14¼ | 14⅜ | 14⅝ | .... | 14⅝ | 14⅝ | 14⅝ | 14⅝ | 14⅞ | 14⅞ | 14⅝ | 14⅞ | .... |
| No. 4 amber | 13¼ | 13¼ | 13 | 13 | 13 | 13 | 13 | 13 | 13⅛ | 13⅜ | 13⅜ | 13¾ | 13⅞ | 14 | .... | 13⅞ | 14 | 14 | 14 | 14¼ | 14¼ | 14⅛ | 14¼ | .... |
| Rolled brown | 9⅝ | 9⅝ | 9½ | 9½ | 9½ | 9½ | 9⅜ | 9⅜ | 9½ | 9⅝ | 9⅝ | 9⅞ | 9⅞ | 9⅞ | .... | 9⅞ | 10 | 10 | 10 | 10¼ | 10½ | 10¼ | 10⅜ | .... |

*Holiday.

the proposition were not revealed and remained a matter of conjecture.

Consumption of rubber in the United States in January increased 60 per cent over that consumed in December and reached 36,669 tons. According to an unofficial market estimate February rubber consumption will be 32,000 tons. Should it reach that tonnage, it will closely approximate the rate attained in January, allowing for the 4 days fewer for operation in February than in January.

Reviewed by weekly periods, the outside market presented the following features:

The week ended February 1, was characterized by a steady price level at 15⅞ cents, although on January 27 the price of spot ribs was 15¼ cents. Trade in actuals was quiet. Primary markets were offering but little rubber, and manufacturers' buying interest was only fair. Prices at the end of the week were as follows:

| Spot | Feb. 1 | Month Ago | Year Ago |
|---|---|---|---|
| Crepe ..... | 15⅝ | 17 | 22¾ |
| Ribs ..... | 15⅞ | 16⅛ | 22½ |
| Upriver fine.... | 16⅜ | 16¼ | 24 |

During the week ended February 8 spot ribs advanced steadily from 15 cents on February 3 to 15¾ cents on Saturday. The advance followed offers of shipment from the Far East at prices in some instances above a parity with the New York market. The Dutch-English restriction conferences were a factor in the situation, and inquiries and bids came from many directions in the consuming trade. Prices at the end of the week follow:

| Spot | Feb. 8 | Month Ago | Year Ago |
|---|---|---|---|
| Crepe ..... | 16⅛ | 15½ | 22¼ |
| Ribs ..... | 15¾ | 14⅞ | 22 |
| Upriver fine.... | 17 | 16 | 24 |

The week ended February 15, was interrupted by a mid-week holiday. Little consuming interest was evident, with prices firm and inclined to advance on account of rumors that Dutch planters had decided to cease tapping during May; this, however, lacked confirmation. After the holiday, trading was dull with ambers easier and other grades unchanged. Very good buying interest appeared at ⅛-cent below asking levels. The week closed dull with standard grades unchanged in price.

| Spot | Feb. 15 | Month Ago | Year Ago |
|---|---|---|---|
| Crepe ..... | 16½ | 15⅜ | 25¾ |
| Ribs ..... | 15⅞ | 14⅝ | 25⅜ |
| Upriver fine.... | 17 | 16¼ | 26 |

The week ended February 22 terminated with a holiday and was marked by better prices and improved consumer interest as the week progressed. The prices on February 17 were unchanged from the close of the previous week with buying interest indifferent at ¼-cent below the market. In the next two days actuals gained ⅜-cent for spot and all positions up to and including June. Good demand developed on the part of manufacturers and local dealers; this continued until the close on Friday, when inquiry had improved still further, and spot advanced ½-cent in sympathy with firm London cables.

| Spot | Feb. 21 | Month Ago | Year Ago |
|---|---|---|---|
| Crepe ..... | 16⅜ | 15½ | 25½ |
| Ribs ..... | 16⅜ | 14⅞ | 25¼ |
| Upriver fine.... | 17 | 16½ | 26¼ |

Importations of all grades in January, 1930, were 47,402 tons, compared to 52,305 tons one year ago. Plantation arrivals for January were 46,404 tons, compared to 51,202 tons one year ago.

**RUBBER AFLOAT TO THE UNITED STATES**

All figures in long tons.

| Week Ended | British Malaya | Ceylon | Netherland East Indies | London and Liverpool | Total |
|---|---|---|---|---|---|
| Feb. 1.. | 5,078 | 1,213 | 1,679 | 98 | 8,068 |
| Feb. 8.. | 9,902 | 1,788 | 2,572 | 31 | 14,293 |
| Feb. 15.. | 7,223 | 1,312 | 1,315 | 59 | 9,909 |
| Feb. 22.. | 7,010 | 1,223 | 2,389 | 51 | 10,673 |

## Rubber Exchange Notes

The following officers for 1930-1931 were elected on February 13 by the board of directors of the Rubber Exchange Clearing House: President, William A. Overton; Vice President, Joseph Louis; Secretary and Treasurer, Theodore B. Carver; Assistant Treasurer, Andrew F. Finkeldey.

The following executive committee was appointed: Harold L. Bache, chairman, Fred B. Peterson, and Marcus Rothschild.

The following have been elected to serve as a floor committee: J. Frank Dunbar, Jr., chairman, Lawrence G. Odell, Lewis D. Raabin, Arthur L. Dunn, and Alfred Croft.

## New York Quotations

***Following are the New York outside market rubber quotations for one year ago, one month ago, and February 24, the current date***

| Plantation Hevea | February 23, 1929 | January 27, 1930 | February 24, 1930 |
|---|---|---|---|
| Rubber latex (Hevea)..gal.. | $1.40 @ | $1.25 @ | $1.25 @ |
| **CREPE** | | | |
| First latex, thin, spot..... | .26¼ @ | .16 @ | .16¾ @.17 |
| February-March ..... | .26¼ @ | .16¼ @ | .16¾ @.17 |
| April-June ..... | .26½ @ | .16¾ @ | .17 @.17½ |
| July-September ..... | .27 @ | .17½ @ | .17½ @.18 |
| Off latex, spot ..... | .26 @ | .15½ @ | .16½ @.16¾ |
| "B" Blanket, spot ..... | .24 @ | .13¾ @ | .15¼ @ |
| February-March ..... | .24 @ | .14 @ | .15¼ @ |
| April-June ..... | .23½ @ | .14½ @ | .15½ @ |
| July-September ..... | .24½ @ | .15 @ | .16 @ |
| "C" Blanket, spot ..... | .23½ @ | .13¼ @ | .15 @ |
| Brown No. 1 ..... | .23½ @ | .13¾ @ | .15¼ @ |
| Brown No. 2 ..... | .23¼ @ | .13¼ @ | .14⅞ @.15 |
| Brown, roll ..... | .19 @ | .09¼ @ | .10½ @.10¾ |
| **Sheet** | | | |
| Ribbed, smoked, spot..... | .25⅜ @ | .15¼ @ | .16½ @ |
| February-March ..... | .25½ @ | .15½ @ | .16½ @.16⅝ |
| April-June ..... | .25⅞ @ | .16 @ | .16¾ @.17 |
| July-September ..... | .26⅛ @ | .16 @.16½ | .17¼ @.17½ |
| **East Indian** | | | |
| **PONTIANAK** | | | |
| Banjermasin ..... | .10½ @ | .08 @ | .09 @ |
| Pressed block ..... | .16½ @ | .14½ @.15 | .15 @ |
| Sarawak ..... | @ | .08 @ | .09 @ |
| **South American** | | | |
| **PARAS** | | | |
| Upriver, fine ..... | .26 @ | .16¾ @ | .17¾ @ |
| Upriver, fine ..... | *.31½ @ | *.22½ @ | *.22½ @ |
| Upriver, coarse ..... | .15½ @ | .08¼ @ | .08½ @ |
| Upriver, coarse ..... | *.22½ @ | *.14½ @ | *.14½ @ |
| Islands, fine ..... | .22½ @ | .15¼ @ | .16¼ @ |
| Islands, fine ..... | *.31 @ | *.22 @ | *.22¼ @ |
| Acre, Bolivian, fine ..... | .26¾ @ | .16½ @ | .17¾ @ |
| Acre, Bolivian, fine ..... | *.32 @ | *.23 @ | *.23 @ |
| Beni, Bolivian ..... | .27 @ | .16¾ @ | .18 @ |
| Madeira, fine ..... | .26 @ | .16¼ @ | .17⅜ @ |

| South American | February 23, 1929 | January 27, 1930 | February 24, 1930 |
|---|---|---|---|
| PARAS—*Continued* | | | |
| Peruvian, fine ..... | $0.24 @ | $0.15½ @ | $0.16½ @ |
| Tapajos, fine ..... | .24 @ | .15½ @ | .16¾ @ |
| **CAUCHO** | | | |
| Upper caucho ball ..... | .15½ @ | .08 @ | .08 @ |
| Upper caucho ball ..... | *.22½ @ | *.14½ @ | *.14¼ @ |
| Lower caucho ball ..... | .15 @ | .06½ @ | .07½ @ |
| **Maniçobas** | | | |
| Ceará negro heads ..... | †.20 @ | †.19 @ | †.19 @ |
| Ceará scrap ..... | †.12 @ | †.11 @ | †.11 @ |
| Manicoba, 30% guaranteed | †.22 @ | †.21 @ | †.21 @ |
| Mangabiera, thin sheet... | †.22 @ | †.21 @ | †.21 @ |
| **Centrals** | | | |
| Central scrap ..... | .14½ @ | .07 @.07½ | .08 @.09 |
| Corinto scrap ..... | .14½ @ | .07 @.07½ | .08 @.09 |
| Esmeralda sausage ..... | .14½ @ | .07 @.07½ | .08 @.09 |
| **Guayule** | | | |
| Duro, washed and dried.. | .21½ @ | .17 @ | .17 @ |
| Ampar ..... | .23 @ | .18 @ | .18 @ |
| **Gutta Percha** | | | |
| Gutta Siak ..... | .20 @ | .16½ @.17 | .16½ @.17 |
| Gutta Soh ..... | .32 @ | .27 @ | .27 @ |
| Red Macassar ..... | 2.75 @ | 2.25 @2.50 | 2.50 @ |
| **Balata** | | | |
| Block, Ciudad Bolivar... | .50 @ | .43 @ | .40 @.41 |
| Colombia ..... | .47 @ | .36 @ | .34 @ |
| Manaos block ..... | .57 @ | .43 @ | .39 @ |
| Panama ..... | .54 @ | @ | @ |
| Surinam sheet ..... | @ | .52 @ | .51 @.52 |
| Amber ..... | .54 @ | .55 @ | .53½ @ |
| **Chicle** | | | |
| Honduras ..... | ‡.68 @ | ‡.68 @ | ‡.65 @ |
| Yucatan, fine ..... | ‡.68 @ | ‡.68 @ | ‡.65 @ |

* Washed and dried crepe. Shipment from Brazil.
† Nominal. ‡ Duty paid.

The following will serve on the quotation committee: Frank D. Pressinger, chairman, Alfred Croft, and Elliot H. Simpson.

The committee on spot quotations will comprise Daniel M. Fraser, Jr., James R. Shannon, and G. A. Sullivan.

## Tonox

Tonox is a new chemical unique in its effect on rubber. It is a solid amine melting at from 60° to 80° C., soluble in organic solvents, and slightly soluble in boiling water. Its specific gravity is about 1.11. It is non-volatile, and tests and experience with it indicate that it is not harmful to workers. In moderate amounts, 0.25 to 1 per cent, Tonox mills into rubber readily and disperses thoroughly. The most notable characteristic of the material is its effect in markedly increasing the abrasive resistance of rubber.

## Foreign Trade Information

*For further information concerning the inquiries listed below address United States Department of Commerce, Bureau of Foreign and Domestic Commerce, Room 734, Custom House, New York, N. Y.*

| Number | Commodity | City and Country |
|---|---|---|
| †43,327 | Rubber goods | Jaffa, Palestine |
| †43,353 | Roofing | Uster, Switzerland |
| †43,368 | Footwear | Copenhagen, Denmark |
| †43,371 | Heels and soles | Santo Domingo, Dominican Republic |
| †43,395 | Sheeting | Ceuta, North Africa |
| *†43,396 | Household accessories | Prague, Czechoslovakia |
| ‡43,412 | Overshoes | Breslau, Germany |
| *43,449 | Tires | Hamburg, Germany |
| †43,514 | Sporting goods | Oslo, Norway |
| *43,525 | Bathing caps and shoes | Abbazia, Italy |
| †43,543 | Druggists' sundries | Berlin, Germany |
| *43,578 | Scrap tires | Tsingtao, China |
| *†43,579 | Belts and transportation straps | Vienna, Austria |
| *†43,580 | Druggists' sundries | Trieste, Italy |
| †43,585 | Balls | Mexico City, Mexico |
| *43,587 | Bathing caps and shoes | Abbazia, Italy |
| †43,642 | Tire repair material | Prague, Czechoslovakia |
| †43,645 | Sport shoes | Asuncion, Paraguay |
| †43,663 | Druggists' sundries | London, England |
| ‡43,671 | Powder box bags | Berlin, Germany |
| †43,687 | Toys, footwear, bathing shoes, surgical, hygienical, and technical articles, and hose | Munich, Germany |
| †43,724 | Rubber goods | London, England |
| †43,747 | Household gloves | Wellington, New Zealand |
| *43,834 | Cushions, pneumatic water bottles, and ice bags | Hertogenbosch, Netherlands |
| †43,837 | Druggists' sundries | Montreal, Canada |

*Purchase. †Agency. *†Purchase and agency. ‡Either.

## Foreign Trade Circulars

*Special circulars containing foreign rubber trade information are now being published by the Rubber Division, Bureau of Foreign and Domestic Commerce, Washington, D. C.*

| Number | Special Circulars |
|---|---|
| 2569 | Czechoslovak Market for Footwear. |
| 2573 | British Exports of Auto Casings, Nov., 1929. |
| 2574 | British Exports of Footwear, Nov., 1929. |
| 2575 | Market for Footwear in Lithuania. |
| 2584 | Pure Gum Rubber Tubing Desired by American Manufacturers of Gases. |

# Rubber Scrap

THE demand for most grades of rubber scrap in February was somewhat better than in January. Dealers, however, are not offering scrap in large quantities. Export demand for inner tubes and solid tires is well sustained both for reclaiming purposes and special remanufacturing without reclaiming.

Boots and Shoes. A fair demand has characterized trade in this grade for the past three months. Black boots and shoes advanced slightly.

Inner Tubes. The movement of inner tubes is fairly active under the stimulus of increasing demand. No change has taken place in the price of inner tubes except mixed tubes, which have advanced ¼-cent a pound.

Tires. There is a little better demand for tires. Three grades of tire scrap have advanced in price. The price spreads are now as follows: mixed auto tires with beads advanced from $18.00—$18.50 in January to $18—$20 per ton; white auto tires with beads advanced from $40—$42 to $45—$48 per ton; white beadless advanced from $48—$49 to $60—$65 per ton.

Solid Tires. The demand for this grade remains good, but accumulations are getting smaller.

Mechanicals. All grades are maintained at the quoted levels of one month ago. The demand for all grades is seasonally fair, especially for No. 1 red and for white druggists' sundries scrap.

Hard Rubber. There is no change of prices in hard rubber scrap. Demand holds dull.

**CONSUMERS' BUYING PRICES**

**Carload Lots**

February 24, 1930

| | Prices |
|---|---|
| **Boots and Shoes** | |
| Boots and shoes, black 100 *lb.* | $1.20 @$1.35 |
| Untrimmed arctics...100 *lb.* | .75 @ 1.00 |
| Tennis shoes and soles 100 *lb.* | .75 @ 1.00 |
| **Inner Tubes** | |
| No. 1, floating...*lb.* | .07 @ .07¼ |
| No. 2, compound...*lb.* | .03½@ .03⅞ |
| Red...*lb.* | .03⅞@ .04 |
| Mixed tubes...*lb.* | .03½@ .03½ |
| **Tires** | |
| Pneumatic Standard— | |
| Mixed auto tires with beads...*ton* | 18.00 @20.00 |
| Beadless...*ton* | 27.50 @28.00 |
| White auto tires with beads...*ton* | 45.00 @48.00 |
| Beadless...*ton* | 60.00 @65.00 |
| Mixed auto peeling...*ton* | 30.00 @31.00 |
| Solid— | |
| Mixed motor truck, clean...*ton* | 24.00 @26.00 |
| **Mechanicals** | |
| Mixed black scrap...*lb.* | .00¾@ .01 |
| Hose, air brake...*ton* | 18.00 @18.50 |
| regular soft...*lb.* | .00½@ |
| No. 1 red...*lb.* | .02 @ .02¼ |
| No. 2 red...*lb.* | .01 @ .01½ |
| White druggists' sundries...*lb.* | .02 @ .02½ |
| Mechanical...*lb.* | .01½@ .01⅝ |
| **Hard Rubber** | |
| No. 1 hard rubber...*lb.* | .08½@ .09½ |

### English Rubber Scrap Market

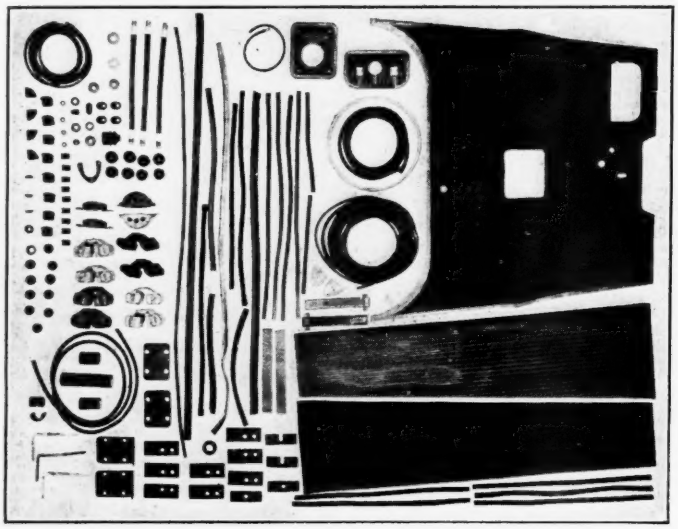
*(By Cable)*

**CONSUMERS' BUYING PRICES**

London, February 24, 1930

| | £ per Ton |
|---|---|
| Galoshes | £3@ £4 |
| Prime ebonite | 25@ 30 |
| Motor tires | 3@ 3½ |
| Floating motor tubes | 35@ 40 |
| Red motor tubes | 17@ 18 |

Market reported steadier.



**More than 400 rubber parts are used in an automobile. The illustration shows some of them used on a Chrysler car. Included are floor mats, running board rubbers, windshield rubbers, insulated wires, engine supporting blocks, rubber spring shackles, door bumpers, closures around floor, openings for steering post, brake and clutch levers, sash rubbers, body joint packing strips, battery insulated wire, connections, prop blocks, washers and tubing, and many molded forms for special applications.**

# Reclaimed Rubber

THE demand for reclaimed rubber was less in February than in January because the stocks in consumers' hands were not converted so generally into manufactured goods as had been anticipated just before the opening of the year. The recovery of the demand for reclaim waits largely on that of the tire manufacturing industry.

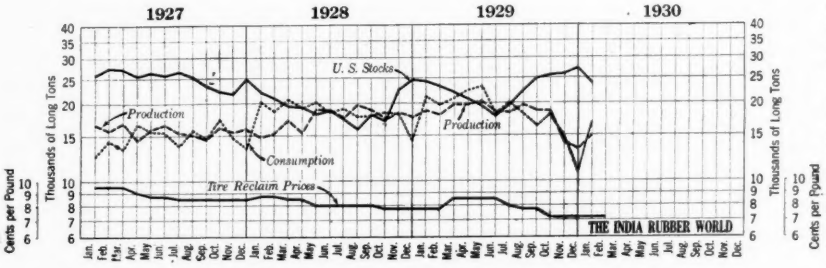
The consumption of reclaimed rubber is estimated at 16,785 tons for January as compared with 11,089 tons in December, 1929.

The production of reclaim during February proceeded at 50 per cent capacity. Prices are steady and are quoted unchanged from those recorded one month ago. These extremely low prices are due to competition, and represent exceptional technical values.

## New York Quotations

February 24, 1930

| | Spec. Grav. | Price Per Pound |
|---|---|---|
| **High Tensile** | | |
| Super-reclaim, black | 1.20 | $0.12 @ $0.12¼ |
| red | 1.20 | .11 @ .11½ |
| **Auto Tire** | | |
| Black | 1.21 | .07 @ .07¼ |
| Black selected tires | 1.18 | .07¼ @ .07½ |
| Dark gray | 1.35 | .08¾ @ .09 |
| Light gray | 1.38 | .09¾ @ .10¼ |
| White | 1.40 | .11½ @ .12 |
| **Shoe** | | |
| Unwashed | 1.60 | .07 @ .07¼ |
| Washed | 1.50 | .09½ @ .10 |
| **Tube** | | |
| No. 1 | 1.00 | $0.12 @ $0.12½ |
| No. 2 | 1.10 | .09½ @ .10 |
| **Truck Tire** | | |
| Truck tire, heavy gravity | 1.55 | .07 @ .07¼ |
| Truck tire, light gravity | 1.40 | .07¼ @ .07½ |
| **Miscellaneous** | | |
| Red | 1.35 | .11¾ @ .12 |
| Mechanical blends | 1.60 | .06½ @ .07 |




Production, Consumption, Stocks, and Prices of Tire Reclaim

## United States Reclaimed Rubber Statistics—Long Tons

| Year | Production | Consumption | Consumption Per Cent to Crude | United States Stocks* | Exports |
|---|---|---|---|---|---|
| 1925 | 132,930 | 137,105 | 35.6 | 13,203 | 4,571 |
| 1926 | 180,582 | 164,500 | 45.9 | 23,218 | 5,391 |
| 1927 | 189,144 | 178,471 | 47.6 | 24,980 | 8,540 |
| 1928 | 208,516 | 223,000 | 50.4 | 24,785 | 9,577 |
| 1929 | 219,057 | 224,253 | 47.9 | 27,464 | 12,721 |
| 1928 | | | | | |
| January | 14,862 | 20,140 | 58.5 | 21,941 | 887 |
| February | 15,291 | 18,670 | 55.4 | 20,848 | 813 |
| March | 17,069 | 20,680 | 57.9 | 19,558 | 879 |
| April | 15,393 | 19,280 | 58.8 | 19,283 | 810 |
| May | 18,945 | 20,215 | 54.1 | 18,137 | 889 |
| June | 18,781 | 18,140 | 48.2 | 18,709 | 350 |
| July | 17,278 | 19,070 | 51.0 | 17,305 | 986 |
| August | 19,049 | 17,890 | 41.7 | 15,881 | 909 |
| September | 18,693 | 17,795 | 44.6 | 17,991 | 809 |
| October | 17,182 | 18,420 | 45.1 | 17,026 | 842 |
| November | 18,245 | 18,380 | 49.1 | 22,399 | 730 |
| December | 17,728 | 14,320 | 45.9 | 24,785 | 673 |
| 1929 | | | | | |
| January | 18,685 | 21,068 | 49.1 | 24,394 | 941 |
| February | 18,094 | 19,829 | 47.7 | 23,305 | 1,028 |
| March | 19,984 | 20,867 | 46.7 | 22,076 | 1,344 |
| April | 19,899 | 22,435 | 47.3 | 20,680 | 1,498 |
| May | 20,385 | 23,176 | 47.1 | 19,479 | 1,299 |
| June | 18,416 | 18,141 | 42.0 | 17,980 | 961 |
| July | 18,387 | 20,236 | 48.7 | 19,679 | 1,202 |
| August | 19,787 | 18,230 | 47.6 | 22,309 | 860 |
| September | 18,660 | 16,416 | 47.2 | 24,984 | 657 |
| October | 18,968 | 18,024 | 51.8 | 25,474 | 830 |
| November | 14,363 | 14,742 | 53.4 | 26,080 | 1,232 |
| December | 13,429 | 11,089 | 47.1 | 27,464 | 869 |
| 1930 | | | | | |
| January | 15,010 | 16,785 | 45.8 | 24,241 | 954 |

*Stocks on hand the last of the month or year.
*Compiled by Rubber Manufacturers Association.*

## National Association of Waste Material Dealers

The seventeenth annual meeting of the National Association of Waste Material Dealers, Inc., at which there will be elected a president and fifteen directors, will be held at the Hotel Astor, New York, N. Y., on March 19, at 2 p. m.

The seventeenth annual banquet of the association is to be held in the Grand Ballroom of the Hotel Astor, New York, on Wednesday evening, March 19. Reservations should be sent to the secretary as early as possible.

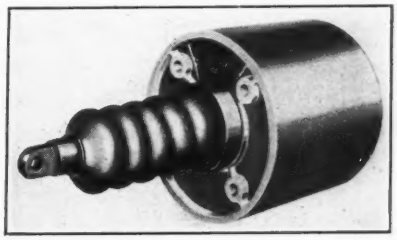
The annual meeting of the Scrap Rubber Division for the election of a chairman for the next fiscal year, will be held at the Hotel Astor on March 19, at 11 a. m. The Chairman of the Division, David Feinburg, will preside, and all members in any way interested in scrap rubber are requested to be present.

## Chicago Group Rubber Division A. C. S.

The next meeting of the Chicago Group, Rubber Division, A. C. S., will be held at Maillard's, Michigan and Jackson Blvds., Chicago, Ill., on March 21, at 6:30 p. m. The subject of the meeting will be milling and mixing, and an engineer from the Farrel-Birmingham Co. will discuss the mechanical and machine design angle. Harlan A. Depew, New Jersey Zinc Co., will speak on the chemistry of milling. Early application for dinner tickets should be made to B. W. Lewis, secretary, 365 Illinois St., Chicago, Ill.

## Booster Brake

THE picture here shown represents the exterior of a so-called booster brake for trucks, busses, fire apparatus, automobiles, and airplanes. It is substantially an air brake cylinder in which the piston is actuated by vacuum originated by operation of the engine. This power serves to apply a pull on the mechanical braking system of the motor vehicle that reenforces the manual braking power.



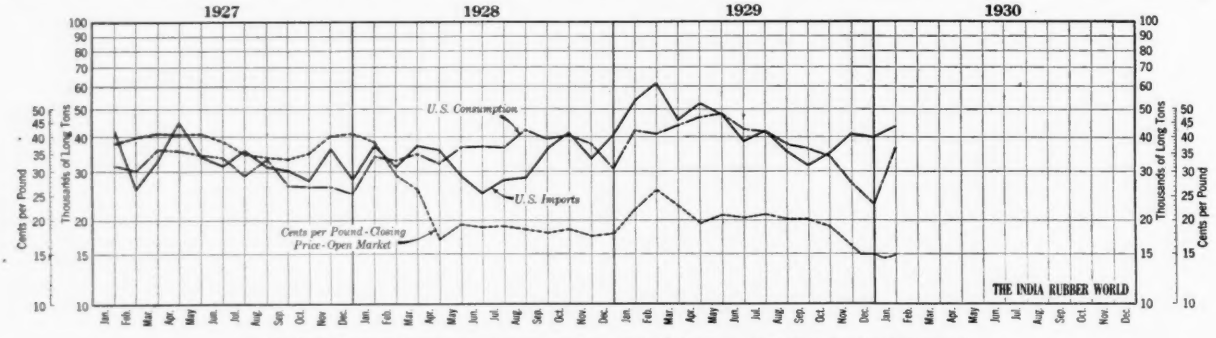
Rubber Cover for Brake Rod

The reciprocating piston rod is protected from road grit by a corrugated molded rubber cover that closes upon itself in bellows fashion as the rod is drawn into the cylinder and expands with the outward motion of the rod. Bragg-Kliesrath Corp., Long Island City, N. Y.

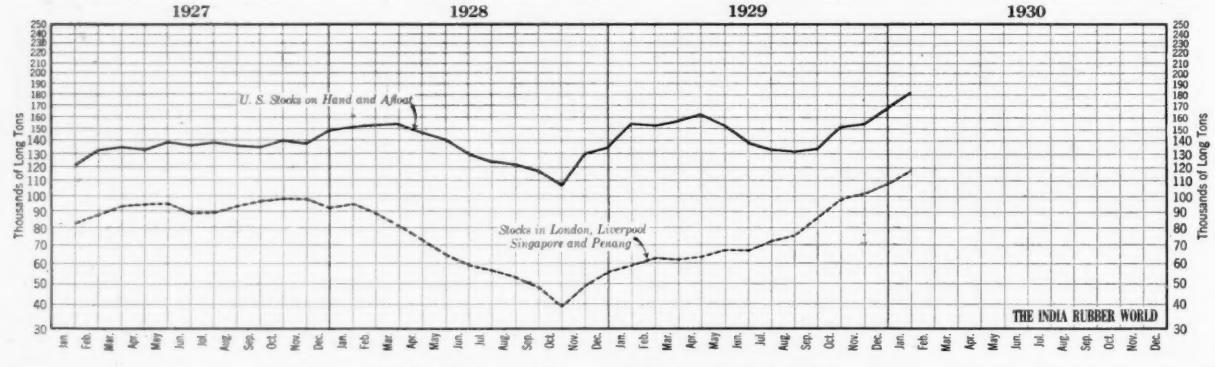
# United States Statistics of Rubber Imports, Consumption, and Stocks

| Twelve Months | Net Imports Tons | Consumption Tons | Stocks on Hand Tons | Stocks Afloat Tons | Total Domestic Stocks Tons | British and Malayan Stocks: London & Liverpool Tons | British and Malayan Stocks: Singapore & Penang Tons | British and Malayan Stocks: Total Tons |
|---|---|---|---|---|---|---|---|---|
| 1925 | 385,596 | 388,000 | 50,985 | 52,421 | 103,406 | 6,328 | 18,840 | 25,168 |
| 1926 | 399,972 | 366,000 | 72,510 | 51,238 | 123,748 | 51,320 | 26,443 | 77,763 |
| 1927 | 403,472 | 373,000 | 100,130 | 47,938 | 148,068 | 66,261 | 25,798 | 92,059 |
| 1928 | 407,572 | 437,000 | 66,166 | 68,764 | 134,930 | 22,603 | 32,905 | 55,508 |
| 1929 | 528,608 | 464,644 | 105,138 | 62,389 | 167,527 | 73,253 | 35,548 | 108,801 |
| 1927 | | | | | | | | |
| January | 42,107 | 31,694 | 76,172 | 45,312 | 121,484 | 57,065 | 25,440 | 82,505 |
| February | 26,312 | 30,306 | 91,186 | 42,166 | 133,352 | 61,170 | 26,766 | 87,936 |
| March | 33,207 | 36,343 | 85,740 | 49,600 | 135,340 | 65,634 | 27,843 | 93,477 |
| April | 45,118 | 36,073 | 92,757 | 38,963 | 131,720 | 69,798 | 24,543 | 94,341 |
| May | 34,135 | 34,787 | 94,563 | 44,181 | 138,744 | 70,099 | 25,133 | 95,232 |
| June | 31,695 | 33,991 | 89,250 | 47,233 | 136,483 | 66,887 | 21,898 | 88,785 |
| July | 36,116 | 29,383 | 98,469 | 40,687 | 139,156 | 66,776 | 22,568 | 89,344 |
| August | 31,349 | 33,647 | 96,148 | 40,937 | 137,085 | 67,836 | 25,764 | 93,600 |
| September | 30,264 | 27,367 | 97,829 | 37,966 | 135,795 | 71,505 | 25,178 | 96,683 |
| October | 28,126 | 26,942 | 97,452 | 42,804 | 140,256 | 72,584 | 25,790 | 98,374 |
| November | 36,619 | 26,943 | 101,034 | 37,076 | 138,110 | 69,896 | 28,369 | 98,265 |
| December | 28,424 | 25,524 | 100,130 | 47,938 | 148,068 | 66,261 | 25,798 | 92,059 |
| 1928 | | | | | | | | |
| January | 37,552 | 34,065 | 110,244 | 41,256 | 151,500 | 68,660 | 25,868 | 94,528 |
| February | 31,415 | 33,370 | 108,955 | 43,316 | 152,271 | 65,307 | 22,867 | 88,174 |
| March | 37,468 | 35,335 | 114,061 | 39,324 | 153,385 | 60,405 | 20,538 | 80,943 |
| April | 36,175 | 32,450 | 113,083 | 33,986 | 147,069 | 55,910 | 16,946 | 72,856 |
| May | 29,112 | 36,965 | 105,356 | 34,374 | 139,730 | 46,882 | 17,687 | 64,569 |
| June | 25,567 | 37,305 | 90,198 | 40,001 | 130,119 | 41,091 | 18,207 | 59,298 |
| July | 28,362 | 37,040 | 83,242 | 42,304 | 125,546 | 37,818 | 18,663 | 56,481 |
| August | 28,827 | 42,505 | 68,994 | 51,875 | 120,869 | 34,364 | 18,971 | 53,335 |
| September | 36,800 | 39,490 | 68,851 | 48,566 | 117,417 | 33,673 | 14,898 | 48,571 |
| October | 41,667 | 40,455 | 66,421 | 41,571 | 107,992 | 26,600 | 12,149 | 38,749 |
| November | 33,846 | 37,095 | 61,956 | 68,119 | 130,075 | 19,988 | 29,188 | 49,176 |
| December | 40,781 | 30,925 | 66,166 | 68,764 | 134,930 | 22,603 | 32,905 | 55,508 |
| 1929 | | | | | | | | |
| January | 53,992 | 42,530 | 76,342 | 78,596 | 154,938 | 28,966 | 29,617 | 58,583 |
| February | 61,331 | 41,137 | 90,058 | 63,825 | 153,883 | 29,659 | 32,373 | 62,032 |
| March | 46,391 | 44,238 | 100,536 | 56,476 | 157,012 | 32,540 | 29,437 | 61,977 |
| April | 52,520 | 47,000 | 107,659 | 55,409 | 163,068 | 35,958 | 27,339 | 63,297 |
| May | 48,475 | 48,692 | 97,192 | 55,404 | 152,596 | 35,828 | 31,932 | 67,760 |
| June | 38,821 | 42,753 | 92,061 | 46,035 | 138,096 | 35,575 | 31,861 | 67,436 |
| July | 41,114 | 41,069 | 92,535 | 38,858 | 131,393 | 35,599 | 35,473 | 71,072 |
| August | 35,397 | 37,854 | 90,769 | 41,618 | 132,387 | 43,165 | 33,124 | 76,289 |
| September | 32,912 | 34,325 | 84,362 | 49,480 | 133,842 | 52,214 | 34,291 | 86,505 |
| October | 36,040 | 34,418 | 88,483 | 62,294 | 150,777 | 61,706 | 34,947 | 96,653 |
| November | 41,097 | 27,355 | 92,219 | 62,358 | 154,577 | 70,109 | 30,913 | 101,922 |
| December | 40,588 | 23,273 | 105,138 | 62,389 | 167,527 | 73,253 | 35,548 | 108,801 |
| 1930 | | | | | | | | |
| January | 44,422 | 36,669 | 120,649 | 61,863 | 182,512 | 81,300 | ..... | ..... |

*Rubber Manufacturers Association figures raised to* 100 *per cent.*




United States Imports, Consumption, and Prices of Ribbed Smoked Sheets




United States, British and Malayan Rubber Stocks

ADVERTISING PAGES REMOVED



# Compounding Ingredients

DURING the past month the demand for compounding materials did not show the increase anticipated chiefly because tire production schedules were not advanced at the anticipated rate owing to the slow picking up of the automobile industry.

Demand is gathering force, however, in footwear, mechanical, wire insulation, heels, clothing, and other lines, and the movement of compounding ingredients for these divisions is seasonally active and of normal volume. Consumption is therefore somewhat less than in January.

ACCELERATORS. Interest in accelerators centers largely in those of general utility, easily manageable and producing good tensile properties. For such the demand is increasing.

ANTIOXIDANTS. Numerous antioxidants are available with now and then a new candidate for favor adapted to arrest rubber deterioration of some specific sort.

BENZOL. In the last week of January pure quality benzol was reduced one cent per gallon. The demand has been steady the past month with some tendency to expansion noted in recent weeks.

CARBON BLACK. Price was reduced ½ cent on February 17. Competition is keen and demand moderate.

CLAY. The market is rather quiet with moderate, steady, and seasonal consuming demand, which is increasing.

SOFTENERS. The list of softeners is growing, but the old familiar ones hold favor with compounders. The most recent aquisition to the list is called Laurex. It is the zinc salt of lauric acid offered as a substitute for stearic acid.

LITHARGE. The consuming demand for rubber work is seasonal and moderate. Prices are well supported by the firmness of the pig metal.

LITHOPONE. Improved demand is noted from the rubber industry. Prices are steady and unchanged.

MINERAL RUBBER. The movement of MR is quite active because of its widely extended use and value in virtually every department of rubber goods manufacture.

V. P. M. NAPHTHA. Late in January prices were raised upward two cents per gallon. The moderate consumption early in February has since become improved and more active.

STEARIC ACID. The demand has shown improvement since the opening of the year, and prices are firm and steady.

ZINC OXIDE. There is a good rubber demand at prices firm and unchanged.

| | | | |
|---|---|---|---|
| **Accelerators, Inorganic** | | | |
| **Lead, carbonate** | *lb.* | $0.08¼ | @ |
| red | *lb.* | .09¼ | @ |
| sublimed blue | *lb.* | .07¼ | @ |
| sublimed white | *lb.* | .07¼ | @ |
| super-sublimed white | *lb.* | .08 | @ |
| **Lime, R. M. hydrated** | *ton* | 20.00 | @ |
| **Litharge** | *lb.* | .08¾ | @ |
| Magnesia, calcined heavy | *ton* | 80.00 | @ |
| carbonate | *lb.* | .06 | @ .07 |
| **Orange mineral A.A.A.** | *lb.* | .11¼ | @ |
| **Accelerators, Organic** | | | |
| **A-7** | *lb.* | .55 | @ .65 |
| **A-11** | *lb.* | .62 | @ .75 |
| **A-16** | *lb.* | .57 | @ .65 |
| **A-19** | *lb.* | .58 | @ .75 |
| **A-20** | *lb.* | .64 | @ .80 |
| **A-32** | *lb.* | .80 | @ .95 |
| Accelerator 49 | *lb.* | .35 | @ .40 |
| Aldehyde ammonia | *lb.* | | @ |
| Butene | *lb.* | | @ |
| **Captax** | *lb.* | .60 | @ .70 |
| **Crylene** | *lb.* | | @ |
| paste | *lb.* | | @ |
| D. B. A. | *lb.* | | @ |
| D. O. T. G. | *lb.* | .42 | @ .47 |
| D. P. G. | *lb.* | .30 | @ .35 |
| Ethylidineaniline | *lb.* | | @ |
| Formaldehydeaniline | *lb.* | | @ |
| **Grasselerator 102** | *lb.* | | @ |
| **552** | *lb.* | | @ |
| **808** | *lb.* | | @ |
| **833** | *lb.* | | @ |
| Heptene | *lb.* | | @ |
| base | *lb.* | | @ |
| Hexamethylenetetramine | *lb.* | | @ |
| Lead oleate, No. 999 | *lb.* | .15 | @ |
| Witco | *lb.* | | @ |
| Lithex | *lb.* | | @ |
| Methylenedianiline | *lb.* | | @ |
| **Monex** | *lb.* | | @ |
| **Phenex** | *lb.* | .70 | @ .75 |
| **Plastone** | *lb.* | | @ |
| **R-2** | *lb.* | 2.00 | @ 2.50 |
| R. & H. 40 | *lb.* | | @ |
| 50 | *lb.* | | @ |
| Safex | *lb.* | | @ |
| S-P-D-X | *lb.* | .70 | @ .75 |
| **Super-sulphur No. 1** | *lb.* | .50 | @ .52 |
| **No. 2** | *lb.* | .18 | @ .25 |
| Tensilac No. 39 | *lb.* | | @ |
| **No. 41** | *lb.* | | @ |
| Thermlo F | *lb.* | | @ |
| Thiocarbanilid | *lb.* | .25½ | @ .28½ |
| Trimene | *lb.* | | @ |
| base | *lb.* | | @ |
| **Tuads** | *lb.* | 3.25 | @ 3.50 |
| V. G. B. | *lb.* | | @ |
| **Waxene** | *lb.* | .30 | @ .40 |
| Z. B. X. | *lb.* | | @ |
| **Z-88** | *lb.* | .50 | @ .60 |
| Zimate | *lb.* | 4.00 | @ 5.00 |
| **Acids** | | | |
| **Acetic 28% (bbls.)** | *100 lbs.* | 3.88 | @ 4.13 |
| **glacial (carboys)** | *100 lbs.* | 14.18 | @14.43 |
| Sulphuric, 66° | *ton* | 15.50 | @ |
| **Alkalies** | | | |
| Caustic soda, solid | *100 lbs.* | 2.75 | @ 3.00 |
| **Antioxidants** | | | |
| **Age-Rite, powdered** | *lb.* | .57 | @ .62 |
| **resin** | *lb.* | .57 | @ .62 |
| white | *lb.* | 1.25 | @ 1.40 |
| **Albasan** | *lb.* | | @ |
| **Antox** | *lb.* | | @ |
| **Grasselerager A** | *lb.* | | @ |

## New York Quotations

February 24, 1930

| | | | |
|---|---|---|---|
| **ANTIOXIDANTS** *(Continued)* | | | |
| Resistox | *lb.* | $0.54 | @$0.65 |
| Stabilite | *lb.* | .62 | @ |
| Stabilite-Alba | *lb.* | .75 | @ |
| Sunproof | *lb.* | | @ |
| **Colors** | | | |
| **BLACK** | | | |
| Bone | *lb.* | .09½ | @ |
| **Carbon (see compounding ingredients)** | | | |
| **Drop (bbls.)** | *lb.* | .05½ | @ .15 |
| **Lampblack (commercial)** | *lb.* | .07 | @ .08 |
| **BLUE** | | | |
| Huber, brilliant | *lb.* | 3.50 | @ 4.00 |
| Prussian | *lb.* | .35 | @ .37 |
| Ultramarine | *lb.* | .06 | @ .30 |
| **BROWN** | | | |
| Huber mocha | *lb.* | 1.60 | @ 2.10 |
| Sienna, Italian, raw | *lb.* | .05½ | @ .12½ |
| **GREEN** | | | |
| Chrome, light | *lb.* | .27 | @ .31 |
| medium | *lb.* | .28 | @ .31 |
| Chromium oxide | *lb.* | .33 | @ .38 |
| Huber brilliant | *lb.* | 3.75 | @ 4.25 |
| **ORANGE** | | | |
| Huber Persian | *lb.* | .50 | @ 1.00 |
| **RED** | | | |
| Antimony | | | |
| Crimson, R. M. P. No. 3 | *lb.* | .48 | @ |
| Sulphur, free | *lb.* | .52 | @ |
| Vermilion, No. 5 | *lb.* | | @ |
| No. 15 | *lb.* | | @ |
| Golden | *lb.* | | @ |
| No. 60 | *lb.* | | @ |
| 7-A | *lb.* | .35 | @ |
| Z-2 | *lb.* | .22 | @ |
| Huber brilliant | *lb.* | 1.35 | @ 1.85 |
| Iron Oxides | | | |
| bright pure domestic | *lb.* | .11 | @ |
| bright pure English | *lb.* | .14 | @ |
| bright reduced English | *lb.* | .10 | @ |
| bright reduced domestic | *lb.* | .10 | @ |
| Indian (maroon), pure domestic | *lb.* | .11 | @ |
| Indian (maroon), pure English | *lb.* | .11 | @ |
| Indian (maroon) reduced English | *lb.* | .09½ | @ |
| Indian (maroon) reduced domestic | *lb.* | .08 | @ |
| Oximony | *lb.* | .13¼ | @ |
| Spanish red oxide | *lb.* | .02½ | @ .04 |
| Sunburnt red | *lb.* | .14 | @ |
| Venetian red | *lb.* | .02 | @ .06 |
| **WHITE** | | | |
| **Lithopone** | *lb.* | .05½ | @ .05¾ |
| **Albalith** | *lb.* | | @ |
| **Azolith** | *lb.* | .05¼ | @ .05¾ |
| **Grasselli** | *lb.* | .05¼ | @ .05¾ |
| **Sterling** | *lb.* | | @ |
| Titanium oxide, pure | *lb.* | .22 | @ |
| Titanox "B" | *lb.* | .07¼ | @ .07¾ |
| Titanox "C" | *lb.* | .07¾ | @ .08¼ |

| | | | |
|---|---|---|---|
| **WHITE** *(Continued)* | | | |
| **Zinc Oxide** | | | |
| AAA (lead free) (bbls.) | *lb.* | $0.07 | @ |
| Azo (factory): | | | |
| ZZZ (lead free) | *lb.* | .06½ | @ .07 |
| ZZ (leaded) | *lb.* | .06¼ | @ .06¾ |
| Z (8% leaded) | *lb.* | .06¼ | @ .06¾ |
| Green seal | *lb.* | | @ |
| Kadox | *lb.* | | @ |
| Red seal | *lb.* | | @ |
| Special | *lb.* | | @ |
| White seal | *lb.* | | @ |
| XX green label | *lb.* | | @ |
| XX red label | *lb.* | | @ |
| **YELLOW** | | | |
| Cadmium sulphide | *lb.* | 1.00 | @ 1.40 |
| Chrome | *lb.* | .17 | @ .17½ |
| Grasselli cadmium | *lb.* | | @ |
| Huber canary | *lb.* | 2.80 | @ 3.30 |
| Ochre, domestic | *lb.* | .01½ | @ .02½ |
| French | *lb.* | .03 | @ |
| Oxide, pure | *lb.* | .09 | @ |
| Zinc, C. P., imported | *lb.* | .21 | @ |
| **Compounding Ingredients** | | | |
| Abrasion Resister | | | |
| Tonox | *lb.* | .60 | @ |
| Aluminum flake (sacks, c.l.) | *ton* | 21.85 | @ |
| (sacks l.c.l.) | *ton* | 24.50 | @ |
| Ammonium carb. pwd. | *lb.* | .10½ | @ |
| lump | *lb.* | .10 | @ |
| **Asbestine** | *ton* | 13.40 | @13.50 |
| Barium carbonate | *ton* | 57.00 | @61.00 |
| Baryta white (f.o.b. St. Louis, bbls.) | *ton* | 23.00 | @ |
| Baryta white (f.o.b. St. Louis, paper bags) | *ton* | $22.20 | @ |
| Barytes, pure white | *ton* | | |
| off color | *ton* | | |
| medium | *ton* | | |
| Foam "A" (f.o.b. St. Louis, bbls.) | *ton* | 23.00 | @ |
| Foam "A" (f.o.b. St. Louis, bags) | *ton* | 23.00 | @ |
| Basofor | *lb.* | .04½ | @ |
| Blanc fixe, dry | *lb.* | .04½ | @ |
| pulp | *ton* | 42.50 | @45.00 |
| Carbon Black | | | |
| Aerfloted arrow | *lb.* | .06 | @ .09 |
| Century (works, La., c. l.) | *lb.* | 5.60 | @ |
| Compressed | *lb.* | .05 | @ .10 |
| Disperso (works, La., c. l.) | *lb.* | 5.60 | @ |
| Flex | *lb.* | .05 | @ .08 |
| Fumonex | *lb.* | .04½ | @ .08 |
| Gastex (f.o.b. fact'y) | | | |
| contracts | *lb.* | .04 | @ .04¾ |
| carload | *lb.* | .05½ | @ |
| less carload | *lb.* | .07 | @ |
| Micronex | *lb.* | .05½ | @ .11 |
| P-33 | *lb.* | .06 | @ .09 |
| Thermax | *lb.* | .04 | @ .07 |
| Uncompressed | *lb.* | .05 | @ .10 |
| Velvetex | *lb.* | .04 | @ .06 |
| Carrara filler | *ton* | | @ |
| Chalk | *ton* | 12.00 | @ |
| Clay, Blue Ridge | *ton* | 9.00 | @20.00 |
| China | *lb.* | .01¼ | @ |
| Dixie | *ton* | 15.00 | @29.00 |
| Langford | *ton* | 10.00 | @ |
| Mineral flour (Florida) | *ton* | | @ |
| Par | *ton* | 7.00 | @ |
| Perfection | *ton* | 25.00 | @ |
| Suprex | *ton* | 8.00 | @20.00 |
| Cotton flock, black | *lb.* | .13 | @ |
| light-colored | *lb.* | .10 | @ .12 |
| white | *lb.* | .12 | @ .30 |

## New York Quotations

February 24, 1930

### Compounding Ingredients—(Continued)

| | | |
|---|---|---|
| Glue, high grade ..... lb. | $0.25 | @$0.35 |
| low grade ..... lb. | .16 | @ .23 |
| Infusorial earth ..... ton | 35.00 | @ |
| Mica amber ..... lb. | .06 | @ |
| Neomerpin, S. A. conc... lb. | .60 | @ |
| Pumice stone, pwd..... lb. | .02½ | @ .04 |
| Rottenstone, domestic.... ton | 23.50 | @28.00 |
| Shellac, fine orange..... lb. | .60 | @ |
| Soapbark (cut) ..... lb. | .09½ | @ .10 |
| Soapstone ..... ton | 15.60 | @22.00 |
| Talc, domestic..... lb. | .01¼ | @ |
| French ..... ton | 18.00 | @22.00 |
| Pyrax A ..... ton | 7.50 | @ |
| Whiting | | |
| Domestic .....100 lbs. | 1.00 | @ |
| English, cliffstone.100 lbs. | 1.50 | @ |
| Imported chalk...100 lbs. | .95 | @ 1.25 |
| Paris White, English cliffstone .....100 lbs. | 1.50 | @ 3.50 |
| Quaker ..... ton | 13.00 | @22.00 |
| Slate flour, gray (fact'y) ..... ton | 7.00 | @ |
| Snow white ..... ton | | @ |
| Sussex ..... ton | 8.00 | @15.00 |
| Vancolloid ..... ton | | @ |
| Westminster Brand.100 lbs. | | @ |
| Witco (l. c. l.) (f.o.b. New York).. ton | 18.00 | @ |

### Factice—See Rubber Substitutes

### Mineral Rubber

| | | |
|---|---|---|
| Fluxrite (solid)..... lb. | | @ |
| Genasco (fact'y)..... ton | 50.00 | @52.00 |
| Gilsonite (fact'y) ..... ton | 37.14 | @39.65 |
| Granulated M. R..... ton | 30.00 | @45.00 |
| Hydrocarbon, hard ..... ton | 24.00 | @40.00 |
| Hydrocarbon, soft..... ton | | @ |
| Ohmlac Kapak, M. R. (f.o.b. fact'y) ..... ton | 60.00 | @ |
| M. 4 (f.o.b. fact'y)... ton | 175.00 | @ |
| Paradura (fact'y)..... ton | 62.50 | @65.00 |
| Pioneer, M. R., solid fact'y ..... ton | 40.00 | @42.00 |
| M. R. granulated..... ton | 50.00 | @52.00 |
| Robertson, M. R., solid (fact'y) ..... ton | 34.00 | @80.00 |
| M. R. granulated..... ton | 38.00 | @80.00 |

### Oils

| | | |
|---|---|---|
| Kerosene ..... gal. | $0.15 | @ |
| Mineral ..... gal. | .20 | @ |
| Poppy seed oil..... gal. | 1.70 | @ |
| Rapeseed ..... gal. | .70 | @ |
| Red oil, distilled ..... lb. | .10½ | @ .10⅝ |
| Rubber process ..... gal. | .25 | @ |
| Spindle ..... gal. | .30 | @ |

### Rubber Substitutes or Factice

| | | |
|---|---|---|
| Black ..... lb. | .08 | @ .14 |
| Brown ..... lb. | .08 | @ .15 |
| White ..... lb. | .09 | @ .16 |

### Softeners

| | | |
|---|---|---|
| Burgundy pitch.....100 lbs. | 6.00 | @ 7.00 |
| Atlas .....100 lbs. | 6.50 | @ |
| Corn oil, crude..... lb. | .10 | @ |
| Cottonseed oil ..... lb. | .10 | @ |
| Cycline oil ..... gal. | .26 | @ .34 |
| Degras ..... lb. | .03¼ | @ .04½ |
| Fluxrite (fluid)..... lb. | | @ |
| Laurex, ton lots..... lb. | .15 | @ |
| Palm oil (Lagos)..... lb. | .09 | @ |
| Palm oil (Niger)..... lb. | .08½ | @ |
| Palm oil (Witco)..... lb. | .11 | @ |
| Para-flux ..... gal. | .17 | @ |
| Petrolatum, snow white.. lb. | .08¾ | @ .08¾ |
| Pigmentar ..... lb. | .02½ | @ .03 |
| Pigmentaroil (tank cars, factory) ..... gal. | .18 | @ |
| (bbls., drums) ..... gal. | .24 | @ |
| Pine oil, dest distilled... gal. | .55 | @ .56 |
| Pine pitch ..... lb. | .04 | @ |
| Pine tar (retort)..... gal. | .26 | @ |
| Rosin K (bbls.)....280 lbs. | 8.65 | @ |
| Rosin oil compounded... gal. | .35 | @ |
| No. 3, deodorized..... gal. | .58 | @ |
| No. 556, deodorized.. gal. | .40 | @ |
| Rubber seed, drums..... lb. | .09½ | @ |
| Rubtack ..... lb. | .11 | @ |
| Stearex ..... lb. | .14 | @ .18 |
| Stearic acid, double pressed ..... lb. | .14½ | @ .15 |
| Tackol ..... lb. | | @ |
| Witco No. 20 ..... gal. | .10 | @ |
| Woburn oil ..... lb. | .05½ | @ .06 |

### Solvents

| | | |
|---|---|---|
| Benzol (90% drums)... gal. | $0.27 | @ |
| Carbon bisulphide (drums) lb. | .05½ | @ .11 |
| tetrachloride (drums).. lb. | .06½ | @ .10 |
| Cyclohexanonemethyl .... lb. | .60 | @ |
| Dip-Sol ..... gal. | .13 | @ |
| Dryolene, No. 9 ..... gal. | .09½ | @ |
| Gasoline | | |
| No. 303 | | |
| Drums, c. l. ..... gal. | .20 | @ |
| Tankcars ..... gal. | .16 | @ |
| Hexalin ..... lb. | .60 | @ |
| Rub-Sol ..... gal. | .08½ | @ |
| Solvent naphtha ..... gal. | .35 | @ |
| Stod-Sol ..... gal. | .09 | @ |
| Turpentine, Venice ..... lb. | .20 | @ |
| dest distilled ..... gal. | .40 | @ .43 |

### Vulcanizing Ingredients

| | | |
|---|---|---|
| Sulphur | | |
| Rubber sulphur...100 lbs. | 1.75 | @ 2.60 |
| Soft rubber (c.l.)..100 lbs. | | @ |
| (l.c.l.) .....100 lbs. | | @ |
| Sulphur chloride..... lb. | .03½ | @ .04 |
| Superfine commercial flour (bbls.) .....100 lbs. | 2.55 | @ 3.10 |
| (bags) .....100 lbs. | 2.20 | @ 2.80 |
| Tire brand, superfine, 100 lbs. | 1.90 | @ 2.25 |
| Tube brand, velvet.100 lbs. | 2.40 | @ 2.75 |
| Velvet flour (240 lb. bbls.) .....100 lbs. | 2.95 | @ 3.50 |
| (150 lb. bags)...100 lbs. | 2.60 | @ 3.15 |
| Vandex ..... lb. | 1.80 | @ 2.10 |
| (See also Colors—Antimony) | | |

### Waxes

| | | |
|---|---|---|
| Beeswax, white, com..... lb. | .55 | @ |
| carnauba ..... lb. | .33 | @ |
| ceresine, white ..... lb. | .12½ | @ |
| montan ..... lb. | .07½ | @ |
| ozokerite, black ..... lb. | .28 | @ |
| green ..... lb. | .28 | @ |
| Paraffin | | |
| 122/124 crude, white scale ..... lb. | .03¼ | @ |
| 124/126 crude, white scale ..... lb. | .03¼ | @ |
| 123/125 full refined.... lb. | .03⅞ | @ |
| 125/127 fully refined... lb. | .04¼ | @ |

## Fashions for Rain

THERE is no reason nowadays why one cannot be so well and fashionably dressed when it rains as when the sun shines. Especially attractive for threatening weather are these raincoats made in Germany by A. Sachs, Leipziger Strasse 51, Berlin, and illustrated and described in the *Gummi-Zeitung*.

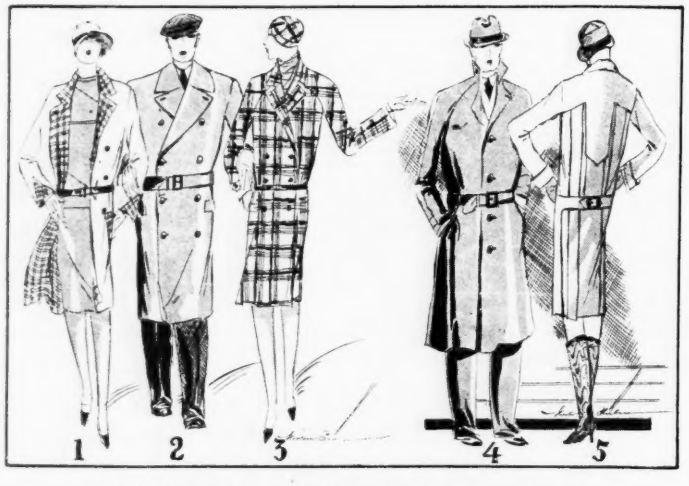
Fashion favors plaid and pastel effects. Rubberized Duchesse, checked taffeta, and rubberized crepe de chine are the popular materials for milady. Inset sleeves vie with raglan ones for favor. Lapels vary in size, and buttons in numbers and rows. Patch and inset pockets are the rule. Belts are decorated with a beautiful mother-of-pearl clasp. The strictly tailored models are designed for traveling and sport wear, while the dressier models are decreed for afternoon wear. To be smartly attired these days, one must have a raincoat for every occasion.

A snappy model, Figure 1, is a rubberized silk coat with a small plaid, pure wool lining. This plaid forms the lapels and collar, and is used as trimming on the pockets and sleeves, forming on the latter, a triangular cuff held down by one button. The gentleman of Figure 2 is sporting a marine blue trench coat featuring two rows of buttons, a wide belt, and wider lapels. His other fair companion, Figure 3, is quite fashionable in her plaid raincoat, mannish in cut, with two rows of buttons and a narrow belt.

The man of Figure 4 is wearing the ever-popular, high-buttoned coat of raglan cut with slanting sewed-in pockets. For the man, too, there is a difference between morning and sport coats. For the former are used rubberized goods with English patterns in all fashionable colors similar to the ulster or belted coat. The man's coat of waterproof woolens is often worn instead of a top coat.

Figure 5 presents a stunning model, which comes in pastel shades. This one is of red rubberized crepe de chine trimmed down the back with long strips of a contrasting color, repeated on the edge of pockets and sleeves. The wider lapel necessitates a wider collar, which gives the coat a new cachet.

Particular attention should be paid to the chic hats which complete these costumes. Especially modish are the cloche and turban models of the same materials as the coats. Garbed in these fetching ensembles the élite may well repeat that phrase—"Let It Rain!"




What the Well-Dressed Abroad Wear When It Rains

ADVERTISING PAGES REMOVED



# Cotton and Fabrics

### American Cotton

THE spot price of middling American cotton on January 27 was 17.20 cents, but 25 points below the opening quotation for the new year and 5 points under that for December 2. By the end of the first week of February it had dropped 2 cents, breaking through both the 17- and 16-cent levels to sell at 15.20 on February 7. This represents a loss of 1.80 cents from the low of 17.00 cents for 1929 reached on November 12, and is 6.45 cents under the high of March 8 of the past year. In the South the decline in spot quotations reached almost 14 cents, a figure well below the Farm Board's loan basis, and the lowest price since the 18,000,000-bale crop of 1926.

Presenting evidence of the need to limit the area planted to cotton in the future, A. W. Palmer, chief of the Cotton Marketing Bureau, is quoted in the *U. S. Daily:* "In the year 1926 acreage and production in the United States were the largest in history. Under the weight of supply, prices broke precipitately and on December 3 of that year reached the low point of 11.40 cents per pound in 10 designated markets. Although acreage fell off in 1927 from its high point in 1926, it has increased each year since 1927, and in the past two years has stood at high levels. The area harvest in 1929 was exceeded only by that in 1926 and 1925.

"For the Cotton Belt as a whole the yield per acre for each of the past three years has been slightly below the 10-year average. It was the low yields of Texas, Oklahoma, and North Carolina—three states which had slightly more than half of the cotton acreage—that reduced the average yield for the country as a whole in 1929."

Since but for the drought in Texas and Oklahoma and the weevils in North Carolina, present prices would have suffered a more serious decline from the burden of the heavier cotton crop.

P. T. Jackson Co. comments: "There is one encouraging feature in the situation.—The southern cotton farmer should not have much difficulty in making up his mind to cooperate in the matter of reducing his acreage this spring."

**WEEKLY AVERAGE PRICES OF MIDDLING COTTON**

| Week Ended | Cents per Pound |
|---|---|
| Feb. 1 | 16.66 |
| Feb. 8 | 15.80 |
| Feb. 15 | 15.84 |
| Feb. 22 | 15.48 |

The American Cotton Cooperative Association announced recently that it plans to conduct a campaign throughout the southern Cotton Belt, with the object of securing a reduction in the total cotton acreage to under 40,000,000 acres. The Farm Board, too, has thrown the weight of its influence into the acreage situation, stating it cannot guarantee to loan 16 cents a pound on the 1930 crop since it "cannot protect farmers when they deliberately overplant."

The *Journal of Commerce* says on February 13, "Acreage is still one of the principal topics of discussion. As Mark Twain observed about the weather, everybody is talking about it but nobody is doing anything about it. Even the American Cotton Cooperative Association and the other agencies interested in cutting down the areas seeded to cotton do not inspire confident belief in success because they are too late in getting under way for effective service."

On February 4 as stated in the *New York Times*, the Farm Board announced that it had approved arrangements made by the American Cotton Cooperative Association to take over all marketing activities of the various member state cooperative associations, and to finance the handling of all cotton of the various member associations. The board also gave assurance that it would not alter its 16-cent loan basis. It was understood that the cooperatives had an offer from a New

## New York Quotations

February 24, 1930

**Drills**

| | | |
|---|---|---|
| 38-inch 2.00-yard | yard | $0.15 @ |
| 40-inch 3.47-yard | | .09 @ |
| 50-inch 1.52-yard | | .20¾ @ |
| 52-inch 1.90-yard | | .16⅞ @ |
| 52-inch 2.20-yard | | .14½ @ |
| 59-inch 1.85-yard | | .17 @ |

**Ducks**

| | | |
|---|---|---|
| 38-inch 2.00-yard D. F. | yard | .16 @ |
| 40-inch 1.45-yard S. F. | | .21⅜ @ |
| 72-inch 1.05-yard D. F. | | .33 @ |
| 72-inch 16.66-ounce | | .36½ @ |
| 72-inch 17.21-ounce | | .37⅜ @ |

**MECHANICAL**

| | | |
|---|---|---|
| Hose and belting | pound | .34 @ |

**TENNIS**

| | | |
|---|---|---|
| 52-inch 1.35 yard | yard | .24 @ |

**Hollands**

**RED SEAL**

| | | |
|---|---|---|
| 36-inch | yard | .14½ @ |
| 40-inch | | .15½ @ |
| 50-inch | | .22½ @ |

**GOLD SEAL**

| | | |
|---|---|---|
| 40-inch, No. 72 | yard | .19⅜ @ |
| 40-inch, No. 80 | | .20⅜ @ |

**Osnaburgs**

| | | |
|---|---|---|
| 40-inch 2.35-yard | yard | $0.13⅝ @ |
| 40-inch 2.48-yard | | .13 @ |
| 40-inch 3.00-yard | | .10⅝ @ |
| 40-inch 10-oz. part waste | lb. | .15½ @ |
| 40-inch 7-oz. | lb. | .11¾ @ |
| 37-inch 2.42-yard | yard | .13¼ @ |

**Raincoat Fabrics**

**COTTON**

| | | |
|---|---|---|
| Bombazine 64 x 60 | yard | .10¾ @ |
| Bombazine 60 x 48 | | .09¾ @ |
| Plaids 60 x 48 | | .12¾ @ |
| Plaids 48 x 48 | | .11 @ |
| Surface prints 64 x 60 | | .13 @ |
| Surface prints 60 x 48 | | .12¾ @ |
| Print cloth, 38½-in., 60 x 48 | | .05½ @ |
| Print cloth, 38½-in., 64 x 60 | | .06½ @ |

**Sheetings, 40-inch**

| | | |
|---|---|---|
| 48 x 48, 2.50-yard | yard | .11 @ |
| 48 x 48, 2.85-yard | | .09½ @ |
| 64 x 68, 3.15-yard | | .10¼ @ |
| 56 x 60, 3.60-yard | | .08¾ @ |
| 44 x 48, 3.75-yard | | .07½ @ .07⅝ |
| 44 x 40, 4.25-yard | | .06¾ @ |

**Sheetings, 36-inch**

| | | |
|---|---|---|
| 48 x 48, 5.00-yard | yard | .06⅛ @ .06¼ |
| 44 x 40, 6.15-yard | | .05 @ .05⅛ |

**Tire Fabrics**

**SQUARE WOVEN 17¼-ounce**

| | | |
|---|---|---|
| Peeler, karded | pound | $0.42½ @ |

**BUILDER 23/11**

| | | |
|---|---|---|
| Peeler, karded | pound | .42½ @ |

**BUILDER 10/5**

| | | |
|---|---|---|
| Peeler, karded | pound | .36½ @ |

**CORD 23/5/3**

| | | |
|---|---|---|
| Peeler, karded, 1 1/16-in. | pound | .42½ @ |

**CORD 23/4/3**

| | | |
|---|---|---|
| Peeler, karded | pound | .44½ @ |

**CORD 23/3/5**

| | | |
|---|---|---|
| Peeler, karded | pound | .47½ @ |

**CORD 15/3/5**

| | | |
|---|---|---|
| Peeler, karded | pound | .40½ @ |

**CORD 13/3/3**

| | | |
|---|---|---|
| Peeler, karded | pound | .39½ @ |

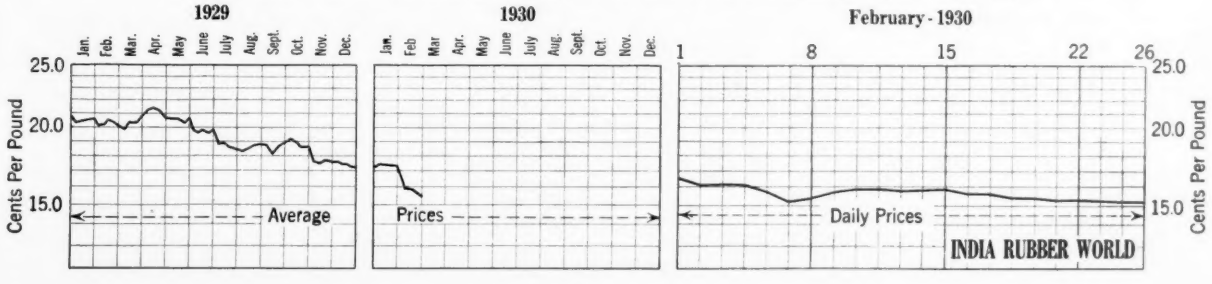
**LENO BREAKER**

| | | |
|---|---|---|
| 8-oz. Peeler, karded | pound | .42½ @ |
| 10-oz. Peeler, karded | | .42½ @ |

**CHAFER**

| | | |
|---|---|---|
| 9.5-oz. Peeler, karded | pound | .45½ @ |
| 12-oz. Peeler, karded | | .44½ @ |
| 14-oz. Peeler, karded | | .42½ @ |

## New York Cotton Exchange Daily Prices of Spot Middling Upland Cotton



York cotton merchant to take over its contracts, and after the market close Harriss & Vose made the following announcement as reported in the *Journal of Commerce:*

"We are prepared to take over, basis of tonight's close at New York and New Orleans, all contracts carried by member firms for the various state cooperative associations, members of the American Cotton Growers' Exchange, and to pay to carrying brokers any debit that may be due."

The *Journal of Commerce* commented as follows: "This, it appears, caused a great flutter in some quarters. To some it was a source of speechless amazement. To some it seemed to come like a breath of fresh air in a close room. To others it sounded simply like something with the right ring suggesting that cotton need not be likened to an altogether friendless orphan. But it did the market no good."

On February 5 the same paper announced, "Cotton marketing operations will be put into effect immediately by the $30,000,000 Cotton Cooperative Association with Allen Northington, its president, in active charge, pending the selection of a general manager of the giant sales agency."

On February 7, on invitation of the Farm Board and as provided by the Agricultural Marketing Act, the cotton cooperatives appointed an advisory commodity committee, such an appointment being necessary before the board could set up the stabilization corporation for the commodity, though in the emergency existing earlier in the week, the board of directors of the Cooperative Association was authorized by the Farm Board to place Mr. Northington in temporary charge of marketing operations.

The world consumption of American cotton reported by the Cotton Exchange Service for the five months ending December 31 was 5,905,000 bales against 6,271,000 bales for the same period last season and 6,936,000 two years ago. The Census Bureau figures for domestic consumption in January are 577,235 bales compared to 688,286 for the same month a year ago.

Stocks at the end of January included 1,830,096 bales in consuming establishments and 5,406,771 bales in public storage against 1,768,165 bales and 4,615,312 bales respectively on January 31, 1929.

The Bureau of Agricultural Economics reports that 14,161,800 bales of American Upland cotton had been ginned up to January 16. Of this amount but 64.4 per cent was white in color and middling or better in grade. From the standpoint of tenderability in settlement of contracts made subject to the cotton futures act, there are indicated a total of but 10,826,800 bales.

John Malloch & Co. state about this subject, "There is no doubt that desirable cotton is strongly held, and in view of the fact that at least one-quarter of the recent American crop is low in grade or so short in staple that it cannot be tendered against future contracts, it is certain that there is no surplus of the grade which is required by the majority of spinners here and in England."

Among other factors on the market's constructive side, the Cotton Exchange Service calls attention to the fact that the price of spot cotton in 10 southern markets at the end of January was 15.62 cents against an average of 18.67 cents last season, 19.72 cents two seasons ago, and 14.40 cents in the big crop year of 1926-27.

Garside notes, "Although the total supply of American cotton is 200,000 bales less than last season, the present price of the staple is about 3 cents below the average of last season, and although the total supply is 1,200,000 bales less than that of two seasons ago, the present price is about 4 cents below the average for that year."

Harriss & Vose: "This is only the third season in the past fourteen years that cotton has been so cheap. On the first of these occasions the world was so plunged in business depression that it could only use about 10,000,000 bales of American cotton, or a little more than half the existing supply. The carryover was 90 per cent of the amount consumed.

"On the second occasion the production was so enormous that even with a record-breaking consumption one-third of the available supply or 50 per cent of the amount consumed had to be carried over. No such conditions exist today. Giving full weight to the textile depression, it is nevertheless true that consumption will fall very little under production. Out of a supply approximately the same as 1920-21, three-fourths, instead of one-half, will be used up, and only about 30 per cent of the amount consumed will be carried over. The present price of cotton is firmly grounded upon a basis of value. It is low whether the cost of production or the statistical position be used as the standards of judgment. The government is opposed to its going down, but we know of none who are opposed to its going up."

As to influences that tend to maintain the present low prices for cotton, G. F. Jones & Son declares, "The situation is merely that a readjustment which should have taken place in November has been delayed by artificial stimulus until now. It remains to be seen whether prices are low enough, and if they are, they should remain fairly constant until some new influence enters, one way or the other."

On February 24 Spot Middlings closed at 14.90, 40 points off from the previous close.

### Egyptian Cotton

In Egypt pegging of the price by the government has effectively presented a decline in either Uppers or Sakels although new crop future contracts have fallen from a good premium above to a considerable discount under old crop deliveries. The present spread between Egyptians and American staples is in favor of the American. This is almost sure to reduce to a minimum the carryover of American staples at the end of the present season.

At the current rate of consumption there is probably more than enough desirable American cotton to satisfy all needs, but if present relatively low prices should stimulate consumption, the need for a generous crop in America this year would soon become apparent.

### Cotton Fabrics

DUCKS, DRILLS, AND OSNABURGS. These fabrics have been moving for the past four weeks under the influence of sharp recession in raw cotton. Prices have declined, and the activity of trading has lessened. Fabrics are selling more than two cents a pound below parity with staple. Mills are looking forward to improved fabric demand and correction of the present cloth price position.

SHEETINGS. Sales have approximated present curtailed production, but have been far below normal. The situation is viewed optimistically because of the apparent firmness of cotton and sales at improved prices.

RAINCOAT FABRICS. The raincoat trade is very quiet owing to general trade conditions and the between-seasons period.

TIRE FABRICS. The general quiet condition that prevailed during January in the tire fabric market continued through February. The sales effected were generally of small and scattered lots for quick delivery. Buyers are awaiting stabilization of the cotton market without which the fabric market is very unsettled. Meantime fabric prices are quoted nominal and unchanged. Buying interest is practically absent except for emergency requirements.

The improvement in the manufacture of tires has not yet influenced fabric demand. Shipments in February were not much better than in January. There are, however, indications that by April production of tires will be increased and larger deliveries of fabrics will be needed.

## Good Demand for Replacement Tires

**Recent prediction by W. O'Neil, president of the General Tire & Rubber Co., Akron, O., that 1930 would be a good replacement tire year is proving to be true.**

**"With the month only half over, sales of General tires for February thus far are 18 per cent ahead of the sales for February, 1929. Most of our distributers are reporting a gain in tire sales over the same period last year, particularly the larger distributers."**

**With the increase in demand for replacement tires already apparent in mid-winter, President O'Neil predicted that there will be an unusual demand for tires as soon as the weather breaks.**

---

**Stedman Rubber Flooring Co.,** So. Braintree, Mass., is the new name of the Stedman Products Co. The following are the officers of the company: Herbert O. Phillips, president; James I. Finnie, treasurer; Merton A. Turner, first vice president; Walter W. Rowse, second vice president; George W. Bailey, secretary. The company's volume of business for 1929 was 23½ per cent larger than 1928, and the outlook is excellent for the current year.

# Crude Rubber Arrivals at New York as Reported by Importers

## Plantations

| | Cases |
|---|---|
| Jan. 15. By "Ascania," London. | |
| H. Muehlstein & Co., Inc. | 142 |
| Jan. 15. By "Calgaric," Far East. | |
| General Rubber Co. | 355 |
| Jan. 15. By "City of Perth," Far East. | |
| General Rubber Co. | 240 |
| Jan. 15. By "Lycaon," Far East. | |
| General Rubber Co. | 4,397 |
| H. Muehlstein & Co., Inc. | 3,034 |
| Chas. T. Wilson Co., Inc. | 882 |
| Jan. 17. By "Mahanada," Far East. | |
| General Rubber Co. | 1,638 |
| H. Muehlstein & Co., Inc. | 800 |
| Jan. 17. By "Glenbank," Far East. | |
| General Rubber Co. | 2,575 |
| H. Muehlstein & Co., Inc. | 100 |
| Jan. 17. By "Penrith Castle," Far East. | |
| General Rubber Co. | 4,783 |
| H. Muehlstein & Co., Inc. | 919 |
| Chas. T. Wilson Co., Inc. | 350 |
| Jan. 21. By "Pres. Wilson," Far East. | |
| General Rubber Co. | 1,922 |
| Adolph Hirsch & Co., Inc. | 28 |
| H. Muehlstein & Co., Inc. | 1,213 |
| Chas. T. Wilson Co., Inc. | 757 |
| Jan. 22. By "Medon," Far East. | |
| General Rubber Co. | 6,264 |
| Adolph Hirsch & Co., Inc. | 136 |
| H. Muehlstein & Co., Inc. | 614 |
| Jan. 24. By "Japanese Prince," Far East. | |
| General Rubber Co. | 4,108 |
| Adolph Hirsch & Co., Inc. | 100 |
| H. Muehlstein & Co., Inc. | 2,486 |
| Chas. T. Wilson Co., Inc. | 1,448 |
| Jan. 25. By "City of Oran," Far East. | |
| Chas. T. Wilson Co., Inc. | 200 |
| Jan 27. By "American Merchant," Far East. | |
| General Rubber Co. | 30 |
| Jan. 28. By "Minnetonka," Far East. | |
| General Rubber Co. | 350 |
| H. Muehlstein & Co., Inc. | 1,046 |
| Jan. 28. By "Silverguava," Far East. | |
| General Rubber Co. | 3,189 |
| H. Muehlstein & Co., Inc. | 160 |
| Chas. T. Wilson Co., Inc. | 250 |
| Jan. 29. By "Elveric," Far East. | |
| General Rubber Co. | 168 |
| Feb. 3. By "Boschdyk," Far East. | |
| General Rubber Co. | 3,879 |
| H. Muehlstein & Co., Inc. | 850 |
| Chas. T. Wilson Co., Inc. | 541 |
| Feb. 3. By "Soemba," Far East. | |
| General Rubber Co. | 2,943 |
| Chas. T. Wilson Co., Inc. | 616 |
| Feb. 4. By "Chinese Prince," Far East. | |
| General Rubber Co. | 3,226 |
| H. Muehlstein & Co., Inc. | 980 |
| Chas. T. Wilson Co., Inc. | 804 |
| Feb. 4. By "City of Winnipeg," Far East. | |
| General Rubber Co. | 628 |
| H. Muehlstein & Co., Inc. | 450 |
| Chas. T. Wilson Co., Inc. | 500 |
| Feb. 7. By "Maidan," Far East. | |
| General Rubber Co. | 2,232 |
| H. Muehlstein & Co., Inc. | 880 |
| Feb. 7. By "Pres. Van Buren," Far East. | |
| General Rubber Co. | *970 |
| H. Muehlstein & Co., Inc. | 450 |
| Chas. T. Wilson Co., Inc. | 942 |
| Feb. 8. By "Comliebank," Far East. | |
| General Rubber Co. | 2,266 |
| H. Muehlstein & Co., Inc. | 109 |
| Chas. T. Wilson Co., Inc. | 150 |
| Feb. 9. By "Olivebank," Far East. | |
| General Rubber Co. | 150 |
| Feb. 12. By "City of Rangoon," Far East. | |
| Chas. T. Wilson Co., Inc. | 100 |
| Feb. 13. By "City of Durban," Far East. | |
| H. Muehlstein & Co., Inc. | 450 |
| Chas. T. Wilson Co., Inc. | 611 |
| Feb. 13. By "Eumaeus," Far East. | |
| General Rubber Co. | *1,668 |
| H. Muehlstein & Co., Inc. | 1,580 |
| Chas. T. Wilson Co., Inc. | 162 |
| Feb. 13. By "Seminole," Far East. | |
| H. Muehlstein & Co., Inc. | 374 |
| Chas. T. Wilson Co., Inc. | 910 |

*Estimated.

## Balata

| | |
|---|---|
| Feb. 6. By "Swinburne," Brazil. | |
| General Rubber Co. | 59 |

## Guayule

| | |
|---|---|
| Jan. 17. By "El Dia," Mexico. | |
| Continental Rubber Co. of N. Y. | 560 |
| Jan. 28. By "El Alba," Mexico. | |
| Continental Rubber Co. of N. Y. | 560 |
| Feb. 3. By "El Coston," Mexico. | |
| Continental Rubber Co. of N. Y. | 1,120 |
| Feb. 6. By "El Dia," Mexico. | |
| Continental Rubber Co. of N. Y. | 560 |

## Paras and Caucho

| | |
|---|---|
| Jan. 25. By "Hubert," Brazil. | |
| General Rubber Co. | 706 |
| Feb. 6. By "Swinburne," Brazil. | |
| General Rubber Co. | 174 |
| Feb. 14. By "Trewyn," Brazil. | |
| General Rubber Co. | 199 |

## Rubber Latex

| | |
|---|---|
| Jan. 17. By "Penrith Castle," Far East. | |
| General Rubber Co. | gals. 38,163 |
| Jan. 28. By "Silverguava," Far East. | |
| General Rubber Co. | gals. 80,198 |

## Ceylon Rubber Exports

**January 1 to December 5, 1929**

| | Tons |
|---|---|
| To United Kingdom | 17,028.27 |
| Continent | 7,313.17 |
| Other countries in Europe | 25.00 |
| Australia | 2,835.38 |
| America | 47,279.35 |
| Egypt | 9.00 |
| Africa | 10.01 |
| India | 83.61 |
| China | 2.00 |
| Japan | 390.16 |
| Other countries in Asia | 7.32 |
| Total | 74,983.27 |
| For the same period last year | 52,204.18 |

**Annual Exports, 1921-1928**

| | Tons |
|---|---|
| For the year 1928 | 57,825.48 |
| 1927 | 55,355.77 |
| 1926 | 58,799.56 |
| 1925 | 45,697.19 |
| 1924 | 37,351.13 |
| 1923 | 37,111.88 |
| 1922 | 47,367.14 |
| 1921 | 40,210.31 |

## Reported Rubber Stocks

Long Tons—1929

| Producing Centers | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|---|---|---|---|---|---|---|
| Singapore | 28,950 | 26,496 | 28,248 | 28,582 | 25,974 | 27,949 |
| Penang | 6,523 | 6,628 | 6,043 | 6,365 | 4,989 | 5,208 |
| Para | 3,658 | 3,678 | 3,462 | 2,955 | 3,237 | 3,103 |
| Totals | 39,131 | 36,802 | 37,753 | 37,902 | 34,200 | 36,260 |
| Manufacturing Centers | | | | | | |
| London | 30,080 | 35,642 | 42,188 | 47,803 | 52,454 | 54,304 |
| Liverpool | 4,661 | 7,507 | 10,026 | 13,903 | 17,655 | 18,949 |
| Amsterdam | 1,569 | 1,867 | 2,203 | 2,222 | 2,150 | 2,179 |
| United States | 95,536 | 90,769 | 84,362 | 88,483 | 92,219 | 105,138 |
| Plantations afloat* | 83,412 | 87,219 | 94,252 | 89,209 | 88,869 | 90,840 |
| Totals | 215,258 | 223,004 | 233,031 | 241,611 | 253,347 | 271,410 |
| Grand totals | 254,389 | 259,806 | 270,784 | 279,513 | 287,547 | 307,670 |

*W. H. Rickinson & Son, *The World's Rubber Position.*
*Compiled by Rubber Division, Department of Commerce, Washington D. C.*

## World Rubber Absorption

Long Tons

| Consumption | Calendar Years 1927 | 1928 | 12 Months' Running Totals, 1929 Aug. | Sept. | Oct. | Nov. |
|---|---|---|---|---|---|---|
| United States | 373,000 | 437,000 | 493,073 | 488,073 | 482,036 | 472,296 |
| United Kingdom | 44,800 | 48,504 | 63,739 | 66,799 | 67,289 | 68,556 |
| Net Imports | | | | | | |
| Australia | 9,516 | 8,430 | 14,600 | 14,850 | 15,209 | *15,200 |
| Belgium | 6,491 | 7,958 | 9,000 | 9,075 | 9,526 | 9,343 |
| Canada | 26,386 | 30,447 | 38,073 | 37,169 | 36,047 | 35,957 |
| France | 34,274 | 36,498 | 53,522 | 53,887 | 54,648 | *54,600 |
| Germany | 38,892 | 37,855 | 48,635 | 49,773 | 48,742 | 48,824 |
| Italy | 11,290 | 12,433 | 16,446 | 16,392 | 17,181 | 17,116 |
| Japan | 20,521 | 25,621 | 32,099 | 33,773 | 33,964 | 35,035 |
| Russia | 12,695 | 15,134 | *8,600 | *9,000 | *9,000 | *9,000 |
| Other reported | 7,908 | 10,365 | 13,474 | 13,646 | 13,855 | 14,340 |
| Other estimated | 8,093 | *11,000 | *11,000 | *11,000 | *11,000 | *11,000 |
| Grand totals | 593,866 | 681,245 | 802,261 | 803,437 | 798,497 | 791,267 |
| Minus United States | 373,000 | 437,000 | 493,238 | 488,073 | 482,036 | 472,296 |
| Total foreign | 220,866 | 244,245 | 309,023 | 315,364 | 316,461 | 318,971 |

*Provisional figure.
*Compiled by Rubber Division, Department of Commerce, Washington, D. C.*

## World Rubber Production—Net Exports

Long Tons—1929

| British Malaya | Total 1928 | July | Aug. | Sept. | Oct. | Nov. | Dec. |
|---|---|---|---|---|---|---|---|
| Gross exports | 409,500 | 46,454 | 50,441 | 53,484 | 47,937 | 46,279 | 48,513 |
| Imports | 149,787 | 15,071 | 15,469 | 12,392 | 12,516 | 11,204 | 13,451 |
| Net | 259,713 | 31,383 | 34,972 | 41,092 | 35,421 | 35,075 | 35,062 |
| Ceylon | 57,267 | 5,746 | 5,564 | 7,961 | 8,411 | 7,195 | 8,683 |
| India and Burma | 10,790 | 974 | 685 | 384 | 812 | 1,065 | 900 |
| Sarawak | 10,087 | 1,247 | 993 | 832 | 1,047 | 668 | 930 |
| B. N. Borneo | 6,698 | 641 | 641 | 640 | *600 | *600 | *600 |
| Siam | 4,813 | 462 | 431 | 406 | 485 | 278 | 320 |
| Java and Madura | 58,848 | 6,422 | 4,664 | 4,708 | 4,697 | 4,760 | 5,189 |
| Sumatra E. Coast | 82,511 | 7,192 | 7,298 | 7,517 | 8,295 | 6,711 | 8,279 |
| Other N. E. Indies | 121,671 | 13,995 | 10,782 | 10,149 | 10,512 | 9,380 | 11,102 |
| French Indo-China | 9,616 | 555 | 545 | 755 | 893 | 771 | 966 |
| Amazon Valley | 21,129 | 1,457 | 1,563 | 1,566 | 1,606 | 1,442 | 1,674 |
| Other America | 1,490 | 148 | 24 | 79 | 46 | .... | .... |
| Mexican Guayule | 3,076 | 200 | 190 | 107 | 200 | 125 | 100 |
| Africa | 6,124 | 295 | 285 | 318 | 199 | .... | .... |
| Totals | 653,833 | 70,717 | 68,637 | 76,514 | 73,224 | .... | .... |

*Estimated.
*Compiled by Rubber Division, Department of Commerce, Washington, D. C.*

## Low and High New York Spot Prices

| Plantations | 1930* | February 1929 | 1928 |
|---|---|---|---|
| Thin latex crepe | $0.15⅝@$0.16⅞ | $0.22 @$0.27⅜ | $0.28⅛@$0.37¾ |
| Smoked sheet, rubbed | .15 @ .16⅜ | .21¾@ .26⅞ | .28⅛@ .37⅝ |
| **Paras** | | | |
| Upriver, fine | .16¼@ .17 | .23½@ .27¼ | .24 @ .29 |
| Upriver, coarse | .08¼@ .08¾ | .14¾@ 17.¾ | .18¾@ .24½ |
| Upper caucho ball | .08¼@ .08¾ | .14 @ .17¼ | .18¾@ .25 |

* Figured to February 24, 1930.

## Plantation Rubber Exports from Malaya*

January 1 to November 30, 1929

| | From Singapore Tons | From Penang Tons | From Malacca Tons |
|---|---|---|---|
| To United Kingdom | 15,193 | 14,066 | 10,600 |
| British Possessions | 4,846 | 1,016 | 385 |
| Continent of Europe | 25,482 | 4,717 | 6,783 |
| United States | 162,998 | 45,374 | 19,589 |
| Japan | 20,816 | 210 | 1,501 |
| Other countries | 772 | 93 | 10 |
| Totals | 230,107 | 65,476 | 38,868 |

* Excluding all foreign transhipment.

## London Stocks, December, 1929

| London | Landed for Dec. Tons | Delivered for Dec. Tons | Stocked December 31 1929 Tons | 1928 Tons | 1927 Tons |
|---|---|---|---|---|---|
| Plantation | 6,644 | 4,776 | 54,184 | 19,700 | 63,635 |
| Other grades | .... | 14 | 41 | 77 | 105 |
| **Liverpool** | | | | | |
| Plantation | †2,129 | †835 | †18,949 | †2,788 | †2,468 |
| Total tons, London and Liverpool | 8,773 | 5,625 | 73,174 | 22,565 | 66,208 |

†Official returns from the recognized public warehouses.

## United States Exports of Reclaimed and Scrap Rubber For Calendar Year 1929

| To | Reclaimed Pounds | Reclaimed Value | Scrap Pounds | Scrap Value |
|---|---|---|---|---|
| Argentina | 61,969 | $5,811 | 82,075 | $3,597 |
| Australia | 2,135,163 | 155,211 | 9,052 | 724 |
| Austria | ‡2,400 | 4,470 | ..... | ..... |
| Belgium | 226 | 15 | 1,717,358 | 104,744 |
| Canada | 19,050,155 | 1,320,395 | 4,600,466 | 135,935 |
| China | ..... | ..... | 767,532 | 11,087 |
| Cuba | 51,859 | 2,701 | 8,754 | 609 |
| France | 154,805 | 10,125 | 13,312,914 | 652,874 |
| Germany | 259,023 | 22,660 | 6,245,842 | 307,284 |
| Hong Kong | ..... | ..... | 1,679,258 | 17,727 |
| Italy | 20,013 | 2,181 | 393,682 | 18,791 |
| Japan | 212,929 | 14,295 | 4,118,947 | 96,775 |
| Mexico | 169,704 | 20,539 | 140,646 | 5,797 |
| Netherlands | 255,955 | 18,437 | 1,764,731 | 113,179 |
| Spain | 58,467 | 1,897 | 16,647,152 | 764,077 |
| Sweden | 31,104 | 2,978 | 24,498 | 1,092 |
| Union of South Africa | 198,607 | 17,635 | 33,890 | 2,485 |
| United Kingdom | 4,865,244 | 329,803 | 3,783,752 | 210,088 |
| Other countries | 139,538 | 10,023 | 979,817 | 68,764 |
| Totals | 27,707,161 | $1,939,176 | 56,310,366 | $2,515,629 |

## Rubber-Cemented Felt Soles for "Talky" Players

Actors and actresses in talking motion-picture production must walk softly on the sound-proof stages, or even their lightest footfalls may spoil a scene through magnification by the sensitive microphones. Hence they are usually required to have layers of felt put on their shoes. The players are "shoed" by an attendant who carries pieces of felt of many sizes that he can readily apply to the footwear of players while they are seated, and easily remove after they have done their turns. The cement used is the rubber repair adhesive employed generally for attaching rubber heels before nailing. Two coats are used, the first being allowed to get quite tacky before the second is applied, and the felt is then pressed on. Moistened with gasoline or other solvent, the felt sole is easily detached.

## Tire Production Statistics

High Pressure Pneumatic Casings

| | All Types Inventory | All Types Production | All Types Total Shipments | Cord Inventory | Cord Production | Cord Total Shipments |
|---|---|---|---|---|---|---|
| 1928 | ..... | 58,457,873 | 55,721,937 | ..... | 19,402,218 | 19,351,380 |
| 1929 | | | | | | |
| January | 10,284,158 | 5,041,530 | 4,969,647 | 3,651,041 | 1,563,554 | 1,461,104 |
| February | 11,620,960 | 5,183,693 | 3,961,751 | 4,073,644 | 1,373,691 | 974,185 |
| March | 12,263,816 | 5,639,426 | 5,031,101 | 4,330,747 | 1,397,657 | 1,157,188 |
| April | 12,696,808 | 5,912,854 | 5,470,779 | 4,292,167 | 1,305,224 | 1,335,121 |
| May | 13,386,440 | 6,109,026 | 5,388,291 | 4,285,674 | 1,371,987 | 1,356,529 |
| June | 13,197,709 | 5,477,771 | 5,440,693 | 3,885,587 | 1,249,596 | 1,594,201 |
| July | 12,027,230 | 4,856,241 | 5,891,020 | 3,325,494 | 1,162,182 | 1,690,264 |
| August | 10,669,370 | 4,354,353 | 5,883,561 | 2,773,039 | 1,055,483 | 1,681,389 |
| September | 9,656,392 | 3,568,200 | 4,498,772 | 2,351,815 | 905,555 | 1,315,845 |
| October | 9,633,404 | 3,689,184 | 3,719,757 | 2,275,990 | 952,347 | 1,052,969 |
| November | 9,701,415 | 2,702,577 | 2,668,319 | 2,313,743 | 774,620 | 737,920 |
| December | 9,470,368 | 2,445,817 | 2,589,515 | 2,290,236 | 659,410 | 663,992 |

| | Balloon Casings Inventory | Balloon Casings Production | Balloon Casings Total Shipments | Solid and Cushion Tires Inventory | Solid and Cushion Tires Production | Solid and Cushion Tires Total Shipments |
|---|---|---|---|---|---|---|
| 1928 | ..... | 38,878,218 | 35,931,982 | ..... | 508,223 | 512,602 |
| 1929 | | | | | | |
| January | 6,583,958 | 3,470,596 | 3,499,121 | 149,240 | 31,583 | 33,051 |
| February | 7,472,592 | 3,796,660 | 2,976,698 | 145,811 | 29,747 | 31,463 |
| March | 7,858,642 | 4,229,586 | 3,863,650 | 141,902 | 35,441 | 40,205 |
| April | 8,346,727 | 4,601,986 | 4,123,769 | 137,613 | 38,419 | 43,130 |
| May | 9,047,376 | 4,732,416 | 4,022,910 | 133,654 | 39,611 | 42,414 |
| June | 9,274,926 | 4,223,335 | 3,829,506 | 131,633 | 39,741 | 40,355 |
| July | 8,670,534 | 3,689,616 | 4,192,894 | 127,653 | 38,470 | 40,781 |
| August | 7,869,710 | 3,293,595 | 4,192,328 | 117,313 | 32,114 | 42,653 |
| September | 7,266,230 | 2,655,594 | 3,173,529 | 110,596 | 27,702 | 36,125 |
| October | 7,332,047 | 2,728,113 | 2,658,907 | 110,574 | 34,576 | 36,094 |
| November | 7,364,873 | 1,923,296 | 1,924,073 | 117,327 | 30,500 | 24,695 |
| December | 7,160,127 | 1,783,784 | 1,920,396 | 122,200 | 28,452 | 20,832 |

| | High Pressure Inner Tubes Inventory | High Pressure Inner Tubes Production | High Pressure Inner Tubes Total Shipments | Balloon Inner Tubes Inventory | Balloon Inner Tubes Production | Balloon Inner Tubes Total Shipments |
|---|---|---|---|---|---|---|
| 1928 | ..... | 23,255,891 | 23,749,966 | ..... | 36,878,990 | 34,095,223 |
| 1929 | | | | | | |
| January | 4,734,477 | 1,540,272 | 1,800,676 | 6,805,018 | 3,347,660 | 3,630,579 |
| February | 5,159,171 | 1,398,156 | 1,046,042 | 7,572,752 | 3,675,116 | 2,908,406 |
| March | 5,356,289 | 1,475,822 | 1,276,490 | 7,938,587 | 4,120,493 | 3,773,585 |
| April | 5,220,167 | 1,347,128 | 1,447,504 | 8,369,244 | 4,375,920 | 3,921,768 |
| May | 5,017,011 | 1,155,013 | 1,480,293 | 9,167,038 | 4,586,606 | 3,795,350 |
| June | 4,314,644 | 1,177,147 | 1,698,896 | 9,504,071 | 4,049,173 | 3,510,947 |
| July | 3,540,819 | 1,382,118 | 2,135,297 | 8,692,058 | 3,249,014 | 3,945,727 |
| August | 2,927,371 | 1,534,547 | 2,207,751 | 7,673,503 | 2,846,491 | 3,926,368 |
| September | 2,785,533 | 1,549,926 | 1,675,954 | 7,258,870 | 2,598,062 | 3,008,065 |
| October | 3,103,336 | 1,610,942 | 1,274,129 | 7,121,095 | 2,386,892 | 2,475,005 |
| November | 3,264,933 | 1,088,037 | 910,444 | 6,990,953 | 1,745,533 | 1,870,927 |
| December | 3,339,451 | 844,904 | 768,331 | 6,889,213 | 1,940,789 | 1,952,450 |

Cotton and Rubber Consumption Casings, Tubes, Solid and Cushion Tires

| | Cotton Fabric Pounds | Crude Rubber Pounds |
|---|---|---|
| 1928 | 222,243,398 | 600,423,401 |
| 1929 | | |
| January | 19,779,481 | 54,160,529 |
| February | 20,326,530 | 57,558,636 |
| March | 21,238,410 | 61,335,423 |
| April | 23,619,687 | 65,673,453 |
| May | 23,302,120 | 66,028,029 |
| June | 20,358,937 | 56,861,320 |
| July | 18,125,761 | 52,249,004 |
| August | 15,802,783 | 45,458,603 |
| September | 13,469,050 | 39,981,294 |
| October | 13,706,668 | 41,774,943 |
| November | 10,268,770 | 31,185,828 |
| December | 8,676,795 | 26,727,646 |

*Rubber Manufacturers Association figures representing 75 per cent of the industry.*

## Atlanta Meeting A. C. S.

The seventy-ninth meeting of the American Chemical Society will be held at Atlanta, Ga., April 7-11, 1930. Registration opens on Monday at 9 A. M. at Hotel Biltmore, followed by council meeting, subscription dinner, and a reception and dance in the evening. Tuesday will be devoted to two general meetings: one on industrial chemistry and the other a symposium on analytical chemistry. On Wednesday the various divisional meetings will be held, and in the evening Harrison E. Howe, editor of *Industrial and Engineering Chemistry,* will deliver a lecture on "Chemistry Comes South." Thursday morning will conclude the divisional meetings, and the afternoon will be devoted to a barbecue followed by golf or a trip to Stone Mountain. On Friday an industrial trip is scheduled.

# United States Statistics

## IMPORTS OF CRUDE AND MANUFACTURED RUBBER

| | November, 1929 | | Eleven months Ended November, 1929 | |
|---|---|---|---|---|
| UNMANUFACTURED—*Free* | Pounds | Value | Pounds | Value |
| Crude rubber | 97,456,282 | $18,189,306 | *1,116,098,878 | *$223,261,185 |
| Liquid latex | 882,465 | 185,670 | ..... | ..... |
| Jelutong or Pontianak | 1,305,364 | 182,677 | 17,144,003 | 2,301,167 |
| Balata | 28,409 | 11,600 | 1,573,902 | 547,009 |
| Gutta percha | 109,038 | 14,935 | 886,542 | 155,474 |
| Guayule | 280,900 | 47,796 | 2,633,000 | 503,847 |
| Siak, scrap and reclaimed | 960,824 | 17,993 | 19,378,171 | 376,995 |
| Totals | 101,022,382 | $18,649,977 | 1,157,714,496 | $227,145,677 |
| Chicle ..... *dutiable* | 1,129,186 | $574,721 | 11,153,170 | $5,594,029 |
| MANUFACTURED—*Dutiable* | | | | |
| Belting | 3,722 | $2,507 | 62,391 | $33,951 |
| Tires | 784 | 14,707 | 4,370 | 63,537 |
| Other rubber manufactures | ..... | 161,747 | ..... | 2,057,542 |
| Totals | 4,506 | $178,961 | 66,761 | $2,155,030 |

## EXPORTS OF FOREIGN MERCHANDISE

| RUBBER AND MANUFACTURES | | | | |
|---|---|---|---|---|
| Crude rubber | 6,560,752 | $1,300,354 | 75,578,607 | $15,861,454 |
| Balata | 7,270 | 2,314 | 238,968 | 107,027 |
| Gutta percha, rubber substitutes, and scrap | 2,680 | 481 | 93,488 | 9,365 |
| Rubber manufactures | ..... | 6,420 | ..... | 612,851 |
| Totals | 6,570,702 | $1,309,569 | 75,911,063 | $16,590,697 |

## EXPORTS OF DOMESTIC MERCHANDISE

| MANUFACTURED | | | | |
|---|---|---|---|---|
| Reclaimed | 2,076,421 | $141,825 | 25,866,675 | $1,808,531 |
| Scrap and old | 6,069,348 | 229,022 | 51,893,853 | 2,340,567 |
| Rubberized automobile cloth, ..... *sq. yd.* | 142,756 | 70,383 | 1,881,160 | 964,413 |
| Other rubberized piece goods and hospital sheeting ..... *sq. yd.* | 92,325 | 37,222 | 1,544,662 | 689,840 |
| Footwear | | | | |
| Boots ..... *pairs* | 226,605 | 416,632 | 1,403,142 | 2,930,726 |
| Shoes ..... *pairs* | 389,079 | 566,612 | 3,124,355 | 3,373,106 |
| Canvas shoes with rubber soles ..... *pairs* | 504,207 | 326,095 | 7,086,834 | 4,731,608 |
| Soles ..... *doz. pairs* | 17,901 | 49,588 | 137,597 | 390,266 |
| Heels ..... *doz. pairs* | 111,632 | 80,874 | 1,379,823 | 986,040 |
| Water bottles and fountain syringes ..... *number* | 57,209 | 31,676 | 431,902 | 285,364 |
| Gloves ..... *doz. pairs* | 9,310 | 24,818 | 112,132 | 292,214 |
| Other druggists' sundries | ..... | 32,156 | ..... | 382,422 |
| Balloons ..... *gross* | 100,920 | 109,753 | 760,473 | 814,776 |
| Toys and balls | ..... | 12,404 | ..... | 180,146 |
| Bathing caps ..... *doz.* | 4,250 | 6,595 | 177,761 | 378,045 |
| Bands | 44,743 | 22,432 | 447,861 | 237,427 |
| Erasers | 47,179 | 27,927 | 530,678 | 337,762 |
| Hard rubber goods | | | | |
| Electrical goods | 53,079 | 9,200 | 1,856,076 | 243,318 |
| Other goods | ..... | 34,932 | ..... | 412,102 |
| Tires | | | | |
| Truck and bus casings, 6 inches and over, *number* | 27,428 | 598,503 | 263,660 | 6,952,600 |
| Other automobile casings ..... *number* | 172,415 | 1,751,250 | 2,327,920 | 24,149,332 |
| Tubes, auto .. *number* | 139,646 | 262,217 | 1,764,666 | 3,180,083 |
| Other casings and tubes, *number* | 16,802 | 48,828 | 194,016 | 573,153 |
| Solid tires for automobiles and motor trucks ..... *number* | 3,469 | 105,553 | 41,611 | 1,227,672 |
| Other solid tires | 131,900 | 21,527 | 1,551,187 | 281,807 |
| Tire accessories | ..... | 110,808 | ..... | 1,589,264 |
| Rubber and friction tape | 148,237 | 42,040 | 1,553,581 | 454,699 |
| Belting | 463,268 | 268,620 | 5,249,631 | 2,839,863 |
| Hose | 766,213 | 248,649 | 8,571,156 | 2,847,828 |
| Packing | 202,632 | 85,706 | 2,413,215 | 1,097,791 |
| Thread | 145,891 | 145,007 | 1,571,765 | 1,589,652 |
| Other rubber manufactures | ..... | 220,553 | ..... | 2,979,425 |
| Totals | ..... | $6,139,407 | ..... | $71,541,842 |

* Liquid latex included.

## Crude Rubber Imports by Customs Districts

| | *December, 1929 | | Twelve Months Ended *December, 1929 | |
|---|---|---|---|---|
| | Pounds | Value | Pounds | Value |
| Vermont | ..... | ..... | 2,000 | $400 |
| Massachusetts | 3,250,694 | $552,509 | 39,954,176 | 7,439,854 |
| New York | 86,236,002 | 15,809,240 | 1,075,198,856 | 205,651,890 |
| Philadelphia | 1,090,831 | 221,429 | 9,386,554 | 1,794,572 |
| Pittsburgh | ..... | ..... | 2,240 | 583 |
| Maryland | 103,018 | 18,837 | 20,747,562 | 3,812,604 |
| Los Angeles | 4,732,875 | 855,587 | 68,044,099 | 13,101,433 |
| San Francisco | 163,882 | 28,422 | 1,704,000 | 343,101 |
| Oregon | ..... | ..... | 179,264 | 33,738 |
| Washington | ..... | ..... | 33,415 | 6,825 |
| Michigan | ..... | ..... | 144,164 | 29,914 |
| Ohio | 1,262,666 | 219,571 | 43,947,408 | 8,016,312 |
| Colorado | ..... | ..... | 3,577,960 | 731,860 |
| Chicago | ..... | ..... | 17,148 | 3,430 |
| Totals | 96,839,968 | $17,705,595 | 1,262,938,846 | $240,966,516 |

* Including latex, dry rubber content.

# United Kingdom Statistics

## IMPORTS

| | December, 1929 | | Twelve Months Ended December, 1929 | |
|---|---|---|---|---|
| UNMANUFACTURED Crude Rubber From— | Pounds | Value | Pounds | Value |
| Straits Settlements | 17,306,500 | £553,920 | 191,710,600 | £8,067,351 |
| Federated Malay States | 6,305,900 | 216,811 | 74,774,000 | 3,203,468 |
| British India | 1,317,200 | 44,622 | 11,854,800 | 508,418 |
| Ceylon and Dependencies | 3,809,700 | 131,043 | 41,218,600 | 1,774,814 |
| Other Dutch possessions in Indian Seas | 2,105,100 | 63,018 | 26,088,500 | 1,129,399 |
| Dutch East Indies (except other Dutch possessions in Indian Seas) | 2,653,400 | 94,128 | 32,965,500 | 1,425,275 |
| Other countries in East Indies and Pacific not elsewhere specified | 226,100 | 7,777 | 2,930,500 | 123,595 |
| Brazil | 297,200 | 11,199 | 7,532,800 | 329,603 |
| South and Central America (except Brazil) | ..... | ..... | 123,400 | 5,426 |
| West Africa | | | | |
| French West Africa | ..... | ..... | 176,200 | 5,788 |
| Gold Coast | 27,700 | 813 | 394,900 | 16,986 |
| Other parts | 94,800 | 3,571 | 2,012,200 | 83,116 |
| East Africa, including Madagascar | 130,800 | 4,317 | 971,800 | 40,474 |
| Other countries | 286,300 | 9,864 | 2,454,000 | 104,661 |
| Totals | 34,560,700 | £1,141,083 | 395,207,800 | £16,818,374 |
| Gutta percha and balata | 283,000 | 24,689 | 3,992,800 | 322,044 |
| Waste and reclaimed rubber | 639,200 | 7,772 | 10,865,500 | 130,446 |
| Rubber substitutes | 4,800 | 131 | 87,900 | 2,231 |
| Totals | 35,487,700 | £1,173,675 | 410,154,000 | £17,273,095 |
| MANUFACTURED | | | | |
| Tires and tubes | | | | |
| *†‡Pneumatic | | | | |
| Outer covers | ..... | £22,939 | ..... | £440,304 |
| Inner tubes | ..... | 4,283 | ..... | 82,093 |
| Solid tires | ..... | 6,831 | ..... | 93,577 |
| Boots and shoes...*doz. pairs* | 54,319 | 104,447 | 1,045,769 | 1,660,948 |
| Other rubber manufactures | ..... | 191,835 | ..... | 2,096,348 |
| Totals | ..... | £330,335 | ..... | £4,373,270 |

## EXPORTS

| UNMANUFACTURED | | | | |
|---|---|---|---|---|
| Waste and reclaimed rubber | 2,055,700 | £20,027 | 33,589,500 | £259,641 |
| Rubber substitutes | 74,100 | 1,507 | 875,700 | 18,331 |
| Totals | 2,129,800 | £21,534 | 34,465,200 | £277,972 |
| MANUFACTURED | | | | |
| Tires and tubes | | | | |
| ‡Pneumatic | | | | |
| Outer covers | ..... | £290,771 | ..... | £3,521,603 |
| Inner tubes | ..... | 36,018 | ..... | 537,817 |
| Solid tires | ..... | 10,665 | ..... | 159,359 |
| Boots and shoes...*doz. pairs* | 28,109 | 50,404 | 343,786 | 558,739 |
| Other rubber manufactures | ..... | 199,574 | ..... | 2,845,795 |
| Totals | ..... | £587,432 | ..... | £7,623,313 |

## EXPORTS—COLONIAL AND FOREIGN

| UNMANUFACTURED | | | | |
|---|---|---|---|---|
| Crude rubber To— | | | | |
| Russia | 531,100 | £20,205 | 8,375,300 | £362,138 |
| Sweden, Norway, and Denmark | 217,100 | 11,226 | 2,330,200 | 118,925 |
| Germany | 1,848,000 | 67,848 | 31,931,500 | 1,362,561 |
| Belgium | 629,400 | 26,141 | 9,725,200 | 441,814 |
| France | 2,052,500 | 85,676 | 38,555,300 | 1,747,568 |
| Spain | 46,800 | 2,718 | 959,200 | 45,761 |
| Italy | 349,100 | 15,179 | 8,276,600 | 385,617 |
| Other European countries | 449,700 | 18,964 | 6,461,000 | 310,932 |
| United States | 409,900 | 15,925 | 11,234,100 | 461,277 |
| Canada | 1,600 | 110 | 82,500 | 3,405 |
| Other countries | 173,400 | 8,955 | 2,486,700 | 129,649 |
| Totals | 6,708,600 | £272,947 | 120,417,600 | £5,369,647 |
| Gutta percha and balata | 25,800 | 2,679 | 760,600 | 59,510 |
| Waste and reclaimed rubber | 3,100 | 64 | 212,800 | 3,706 |
| Rubber substitutes | ..... | ..... | 4,500 | 105 |
| Totals | 6,737,500 | £275,690 | 121,395,500 | £5,432,968 |
| MANUFACTURED | | | | |
| Tires and tubes | | | | |
| *‡Pneumatic | | | | |
| Outer cover | ..... | £4,770 | ..... | £63,161 |
| Inner tubes | ..... | 523 | ..... | 13,273 |
| Solid tires | ..... | ..... | ..... | 1,068 |
| Boots and shoes....*doz. pairs* | 3,986 | 5,754 | 18,478 | 38,123 |
| Other rubber manufactures | ..... | 11,218 | ..... | 100,327 |
| Totals | ..... | £22,265 | ..... | £215,952 |

*After April 12, 1927, tires and tubes imported with complete vehicles or chassis, or fitted to wheels imported separately, are included under complete vehicles or parts.

†Motor cars, motorcycles, parts, and accessories, liable to duty from Sept. 29, 1915, until Aug. 1, 1924, inclusive, and after July 1, 1925. Commercial vehicles, parts, and accessories were exempt from duty until April 30, 1926, inclusive, and rubber tires and tubes until April 11, 1927, inclusive.

‡Tires and tubes included prior to April 12, 1927.

# S. A. E. TIRE AND RIM STANDARDS

*Tire and Rim Division Report Approved*

**The following tables of tire and rim sizes were approved as standards on January 20, 1930, at the annual meeting of the Standards Committee of the Society of Automotive Engineers.**

### Tires and Rims for Passenger Cars

The accompanying table of passenger-car tire and rim sizes and dimensions was adopted by the Society as representing those that meet controlling engineering requirements and being suitable for original equipment on passenger cars. The sizes shown include those actually used sufficiently to warrant including them in the table as standard. The dimensions of the tires and rims correspond with those adopted by the Tire and Rim Association of America as of December 13, 1929.

| | Tire Sections, In. | | | | | | |
|---|---|---|---|---|---|---|---|
| Nominal Rim-Diameter, In. | 4.75 | 5.00 | 5.25 | 5.50 | 6.00 | 6.50 | 7.00 |
| 18 | ..... | ..... | 5.25-18 | 5.50-18 | 6.00-18 | 6.50-18 | 7.00-18 |
| 19 | 4.75-19 | 5.00-19 | 5.25-19 | 5.50-19 | 6.00-19 | 6.50-19 | 7.00-19 |
| 20 | ..... | ..... | ..... | ..... | 6.00-20 | 6.50-20 | 7.00-20 |
| Flat-base Rim-Section, Width, In. Nominal | ..... | 4 | 4 | 4 | 4½ | 4½ | 5 |
| Actual | 2.75-*D* | 2.69-*E* | 2.69-*E* | 2.69-*E* | 3.12-*F* | 3.12-*F* | 3.75-*F* |
| Maximum Tire-Width on Flat-Base Rim, In. | 5.05 | 5.15 | 5.35 | 5.60 | 5.95 | 6.40 | 6.90 |
| Drop-Center Rim-Section Width, In. | 3.00-*D* | 3.00-*D* | 3.25-*E* | 3.25-*E* | 3.62-*F* | 3.62-*F* | 4.00-*F* |
| Maximum Tire-Width on Drop-Center Rim, In. | 5.20 | ..... | ..... | ..... | ..... | ..... | 7.05 |

Method of Marking for Balance.—Tires shall be marked for balance by a red dot or a ¼-in. square on the serial side of the casing just above the rim flange.

### Passenger Car Tire Load and Inflation Pressure Table

The accompanying table is the standard of the Tire and Rim Association of America as of its meeting of December 13, 1929, and is published by the Society as information supplementing the tables of S.A.E. Standard tire and rim sizes and dimensions adopted by the Society in January, 1930.

| Minimum Inflation-Pressure Lb. | Tire Sections and Rim Diameters, In. | | | | | | | | | | | | | | | | Minimum Inflation-Pressure Lb. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 4.40 | | 4.50 | | 4.75 | | 5.00 | | 5.25 | | 5.50 | | 6.00 | | (6.20) 6.50 | | (6.75) 7.00 | | |
| | 18 and 19 | 20 and 21 | 18 and 19 | 20 and 21 | 18 and 19 | 20 and 21 | 18 and 19 | 20 and 21 | 18 and 19 | 20 and 21 | 18 and 19 | 20 and 21 | 18 and 19 | 20 and 21 | 18 and 19 | 20 and 21 | 18 and 19 | 20 and 21 | |
| | Maximum Load Per Tire, Lb. | | | | | | | | | | | | | | | | | | |
| 28 | 610 | 650 | 650 | 700 | 700 | 745 | 745 | 815 | 815 | 880 | 880 | 925 | 960 | 1,025 | 1,075 | 1,140 | 1,200 | 1,300 | 28 |
| 30 | 660 | 700 | 700 | 750 | 750 | 800 | 800 | 870 | 870 | 940 | 940 | 1,000 | 1,025 | 1,105 | 1,155 | 1,230 | 1,300 | 1,400 | 30 |
| 32 | 710 | 750 | 750 | 805 | 805 | 855 | 855 | 925 | 925 | 1,000 | 1,000 | 1,075 | 1,100 | 1,190 | 1,240 | 1,320 | 1,400 | 1,500 | 32 |
| 34 | 760 | 800 | 800 | 850 | 850 | 910 | 910 | 980 | 980 | 1,060 | 1,060 | 1,150 | 1,175 | 1,270 | 1,320 | 1,410 | 1,500 | 1,600 | 34 |
| 36 | 810 | 850 | 850 | 900 | 900 | 965 | 965 | 1,040 | 1,035 | 1,120 | 1,120 | 1,225 | 1,250 | 1,350 | 1,400 | 1,500 | 1,600 | 1,700 | 36 |

Single underscoring denotes maximum recommended loads for 4-ply tires.
Double underscoring denotes maximum recommended-loads for 6-ply tires.
Note 1. In the above table the weights are based on average passenger load using 150 lbs. as weight per passenger and calculated as follows:
All two, three, and four-passenger cars, two-passenger load (midway).
All five-passenger cars, three-passenger load, two midway and one over rear axle.
All seven-passenger cars, four-passenger load, two midway and two over rear axle.
Note 2. This table not to be used for busses or trucks.
Note 3. To take care of front-wheel steering and tread-wear conditions, it is recommended that front tires be inflated to same or greater pressure as rear tires, depending on recommendations of car manufacturers.

### Balloon Tires and Rims for Commercial Vehicles

The accompanying table of commercial vehicle tires and rim sizes and dimensions was adopted by the Society as representing those that meet controlling engineering requirements and being suitable for original equipment on commercial vehicles. The sizes shown include those actually used sufficiently to warrant including them in the table as standard. The dimensions of the tires and rims correspond with those adopted by the Tire and Rim Association of America as of December 13, 1929.

| | Tire Sections, In. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Nominal Rim-Diameter, In. | 5.50 | 6.00 | 6.50 | 7.00 | 7.50 | 8.25 | 9.00 | 9.75 | 10.50 |
| 20 | 5.50-20 | 6.00-20 | 6.50-20 | 7.00-20 | 7.50-20 | 8.25-20 | 9.00-20 | 9.75-20 | 10.50-20 |
| 22 | ..... | ..... | ..... | ..... | ..... | 8.25-22 | 9.00-22 | 9.75-22 | ..... |
| Nominal Rim-Section Width, In. | 5 | 5 | 5 | 5 | 6 | 7 | 7 | 8 | 9-10 |
| Actual Rim-Width between Flanges, In. | 3.75 | 3.75 | 3.75 | 3.75 | 4.33 | 5.00 | 5.00 | 6.00 | 7.38 |
| Rim-Flange Height, In. | 1 | 1 | 1 | 1 | 1⅛ | 1⅛ | 1⅛ | 1⅛ | 1¾ |
| Maximum Permissible Tire-Width, In. | ..... | 6.20 | 6.70 | 7.20 | 7.75 | 8.50 | 9.25 | 10.05 | 10.95 |

### High Pressure Tires and Rims for Commercial Vehicles

The accompanying table of commercial vehicle tire and rim sizes and dimensions was adopted by the Society as representing those that meet controlling engineering requirements and being suitable for original equipment on commercial vehicles. The sizes shown include those actually used sufficiently to warrant including them in the table as standard. The dimensions of the tires and rims correspond with those adopted by the Tire and Rim Association of America, as of December 13, 1929.

| | Tire Sections, In. | | | | | | |
|---|---|---|---|---|---|---|---|
| Nominal Rim-Diameter, In. | 5 | 6[a] | 7 | 8 | 9 | 9[a] | 10 |
| 20 | 30x5 | 32x6 | 34x7 | 36x8 | 38x9 | 38x9 | 40x10 |
| 24 | 34x5 | 36x6 | 38x7 | 40x8 | 42x9 | 42x9 | 44x10 |
| Rim-Section, Wid.h, In. Nominal | 5 | 6 | 7 | 8 | 8 | 9-10 | 9-10 |
| Actual | 3.75 | 4.33 | 5.00 | 6.00 | 6.00 | 7.33 | 7.33 |
| Rim-Flange Height, In. | 1 | 1⅛ | 1⅛ | 1⅛ | 1⅛ | 1¾ | 1¾ |
| Maximum Permissible Tire-Width on Rim, In. | 6.05 | 6.90 | 8.05 | 9.20 | 10.15 | 10.60 | 11.80 |

[a] Eight-ply 6 in.-20 to be 6.55 in. maximum on 5-in truck rim.
[b] Recommended practice.

### Truck and Motor Coach Balloon Tire Load and Inflation Pressure Table

The accompanying table is the standard of the Tire and Rim Association of America, as of its meeting of December 13, 1929, and is published by the Society as information supplementing the tables of S.A.E. Standard tire and rim sizes and dimensions adopted by the Society in January, 1930.

| Minimum Inflation-Pressure, Lb. | Tire Sections and Rim Diameters, In. | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 5.50 | 6.00 | 6.50 | 7.00 | 7.50 | 8.25 | 9.00 | 9.75 | 10.50 |
| 35 | 1,075 | | | | | | | | |
| 40 | 1,225 | 1,250 | | | | | | | |
| 45 | | 1,400 | 1,450 | 1,700 | | | | | |
| 50 | | | 1,650 | 1,900 | 1,975 | 2,250 | | | |
| 55 | | | | | 2,200 | 2,525 | 2,900 | | |
| 60 | | | | | | 2,800 | 3,200 | 3,600 | |
| 65 | | | | | | | 3,500 | 3,900 | 4,400 |
| 70 | | | | | | | | 4,200 | 4,700 |
| 75 | | | | | | | | | 5,000 |

Underscoring indicates maximum recommended loads.

## Hewitt-Gutta Percha Prosperous

**Factory and General Offices of the Hewitt-Gutta Percha Rubber Corp., Buffalo, N. Y.**

The Hewitt-Gutta Percha Rubber Corp., formed by the absorption of the Gutta Percha & Rubber Mfg. Co. of New York by the former Hewitt Rubber Co., has improved and increased its manufacturing facilities. Its output of heavy mechanical rubber goods, especially hose, belting, and packings, is steadily increasing in tonnage and last year reached a record figure.

The company specializes in transmission and conveyer belting and hose for heavy duty mine, quarry, and oil-field work. Its rotary hose is successfully meeting the heavy duty required of such goods. The same is true of its line of steam hose for industrial and railway use. The company is the sole maker of the Robins conveyer belt used in all parts of the world for conveying ore, coal, rock, etc., at mines and docks.